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The New Railway Bill.

LORD STANLEY of Preston introduced the Government Railway Bill into the House of Lords last week without preface or comment. It consists of four parts and forty-six clauses, together with a short schedule, and, in the arrangement of the parts, as well as in many of the provisions, is almost identical with Mr. Mundella's measure of last year. It was inevitable that the permanent appointment of the Railway Commission should occupy a prominent place; and the first part of the Bill, as before, deals with this subject. Last year's proposal was that the re-constituted Commission should consist of three members,—a Judge of the High Court as Chief Commissioner, with two "practical men of business" as his colleagues. Although the eminent services of the present Commissioners warranted a belief that they would not be passed over in the selection, the terms of the Bill left it open for the Government to appoint men who were not so thoroughly acquainted with this particular subject. Lord Stanley's scheme provides that there shall be three appointed, and three *ex officio* Commissioners, and with regard to one of the former, experience in railway business is made a necessary qualification. The Chief Commissioner is to be "of experience in the law," so that, as regards the three appointed Commissioners, the constitution of the Court is similar to that of the existing Commission, except that the "legal" member was not previously named as the chief. Although the *ex officio* members are three in number, there is really but one added to the strength of the Court, as these members are to be Judges of Superior Courts for England, Scotland, and Ireland respectively, so that one of them may attend important cases in whichever part of the kingdom it may be necessary that they should be heard. The fact that the permanent Commissioners are to devote their whole time to their duties under the Act is a distinct improvement upon Mr. Mundella's arrangement, under which the President of the Court would be at times occupied with other and varied business. The jurisdiction given to the Court is much the same as that conferred upon the Railway Commission by the Act of 1873. They may hear and determine any disputes as to tolls and rates, and order any reasonable traffic facilities,—notwithstanding any agreements existing between companies,—and award damages in cases where any aggrieved party may, in their opinion, justly claim them. Rating appeals to which railway and canal companies are parties may be transferred to them, and this part of the Bill should be satisfactory to the companies themselves, as they sometimes seem to think that they receive scant justice at Quarter Sessions. A necessary clause,—but one which will probably meet with opposition,—is that giving a *locus standi* to associations, &c., for the purpose of making complaints without there being any proof that such authority is aggrieved in the matter. This is essential, as the forces are so unequal in a contest in which an isolated individual or firm enters the lists against a railway company. The law of "might is right" has too often prevailed, and under a system allowing a corporate body to prosecute such cases, they would have a much better chance of being carried to a fair and legitimate conclusion. A safeguard against vexatious actions is provided by a clause making it necessary for such an association to obtain a certificate to the effect that it is, in the opinion of the Board of Trade, a proper body to make such complaint.

The main bone of contention will be the clause dealing with rates and charges, which is again No. 24. In comparing this part of the Bill with that of last year, and finding clauses deemed unsatisfactory by both parties re-inserted almost word for word, one is irresistibly reminded of a recent utterance of Sir Edward Watkin's. Speaking of the trade of this country, and that of the United States, he said:—"The American Ministers are men of business, but our governing body are not. The great interests of the country are best served by being in the hands of men who have risen from business to statesmanship. *Our people have no initiative.*" The present Government are flattering Mr. Mundella in adopting his plan for settling the difficulty,—though it is quite probable that he in turn had adopted it from a predecessor in office,—but as this plan has already been discussed and found but little favour, it is somewhat disappointing to find that we have still no alternative proposition. At the same time, it must be allowed that the difficulties in the way of satisfying the demands of those interested are very great, and the Government doubtless trust to receiving suggestions during the passage of the measure through the House, which they may adopt in amendments, and which may tend to render it more acceptable. The directions to the railway companies are rather more definite and precise, and are that within twelve months from the commencement of the Act (January 1st, 1888) they shall submit to the Board of Trade revised classifications of *merchandise traffic*, and revised schedules of charges,—the words in italics now appearing for the first time. They are instructed to set forth the nature and amount of all terminal charges, showing the circumstances under which such charges are proposed to be made. The Board of Trade are to receive and consider objections, and to endeavour to bring about an agreement on points of difference, and submit the classification and schedules to Parliament as finally revised for the purpose of being made law. If the parties fail thus to agree, the Board of Trade are to decide upon a classification which appears to themselves to be just and reasonable. The Board is also constituted arbiter in case of subsequent dispute, with power to relegate such matters to "any other competent person" who will act as negotiator. It seems strange that this responsibility should be put upon the Board of Trade with a permanent Railway Commission in existence, and the authority given to the former body to depute some person outside the Board to communicate between the disputants indicates that it is foreseen that they themselves may not be sufficiently acquainted with the details of railway work to deal satisfactorily with the cases which may arise. It is worthy of remark that a Bill recently brought into the House of Commons (the St. Austell Valleys Railway and Dock Bill) provides that if any question shall arise as to the reasonableness of the rates charged for certain services, the same shall be from time to time referred to and determined by the Board of Trade, so that the promoters of that measure, at all events, are not disinclined to submit to the arbitration of the Board. It is probably intended to relieve the Commission of cases which can be disposed of without their intervention, those in which no amicable settlement can be arrived at being eventually referred to them. It is quite possible that the system may be found advantageous from a public point of view, as the results of such proceedings are to be reported to Parliament. Very definite directions are given for the publication of rates and charges of every description, and a great point will be gained if the public are enabled to tell readily what the railway companies are really empowered to charge, this being next to impossible at present. The conditions under which "group rates" are legalised are clearer, but the clause, as before, clashes with those relating to preference rates. A practical way of reconciling these matters would be very welcome, but in this also we look in vain for "initiative" in the present measure.

Preference rates are again strictly prohibited, but with a mischievous reservation, which destroys the value of the clause from the home-producer's point of view, and which should

reconcile the railway companies to this part of the Bill, as it makes their position stronger than before. This saving-clause (adopted without alteration from last year's Bill) runs thus :—"In deciding whether a lower charge or difference of treatment does or does not amount to an undue preference, the Commissioners may, so far as they think reasonable, in addition to any other considerations affecting the case, take into consideration whether such lower charge or difference of treatment is necessary for the purpose of securing the traffic in respect of which it is made." The letter of "B." in the *Times* of February 9th, commenting upon the statement that the Great Eastern Railway charged twice as much for bringing fish from Harwich as they do from Rotterdam, says,—"They would charge more for the Rotterdam traffic if they could, but if they did they would not get the traffic. The fish would come direct by sea, or not at all. They do not make the Rotterdam rate low to give the Dutchman advantage, but simply because they cannot help it. They do not exact double profits from the home trade to make up a loss on the foreign. They do not act unfairly or unjustly to the people of Harwich because they make some profit on the foreign trade. The railway company would not construct its railway to carry Rotterdam fish at the price at which it carries it, but the railway being there it ekes out its miserable profit by carrying at the rate it does." It would appear that if, as is stated, some profit is made on the foreign trade, this result can only be arrived at by ignoring a great part of the working expenses in calculating this profit, simply because these expenses are already incurred in connexion with home traffic. But if, as would naturally be supposed, the amount of profit is arrived at by comparing the total of receipts from both sources with the total expense incurred, the profit on the inland traffic must be enormous. The railway managers assert that they carry no traffic at a loss, even the lowest rates yielding a margin of profit over working expenses, and if this be true in the case in question, our conclusion must be true also ; or, on the other hand, it must be inferred that the preference complained of can only be given at the expense of the English fisherman. It will be hard to convince the latter that he is not thereby prejudiced, even though the consignee, and not he, has to pay for the carriage ; for were he not thus handicapped he would get a correspondingly higher price for his fish (to which the fact of his being nearer the consumer entitles him) and thus be encouraged to send larger consignments, instead of, as is frequently the case, being compelled to labour for nothing. Lower prices rule than formerly, too, for agricultural produce, owing to the exceptional facilities given to the imported traffic and when the inland rates are not lowered, the percentage of carriage to value is so far increased that it ceases to be profitable to grow many crops, except for local demand. The way in which both the trains and delivery vans of competing companies race each other for the import traffic indicates that it is considered remunerative, and although (according to the argument of "B") the railways were not constructed for the purpose of carrying this traffic, it is driving out of the market many of those for whose benefit they were constructed. Of course, we are not going so far as to say that the railways were intended for the benefit of this or that class only, and that the consumer is not to be considered, for it is precisely the extent of the consideration which these interests are respectively entitled to that lies at the root of the question.

The following definition of "terminals" is given in clause 43, putting a very different and much wider construction upon the term than that implied by the phrase "handling terminals." "The term 'terminal charges' includes charges in respect of stations, sidings, wharfs, depôts, warehouses, cranes, and other similar matters, and of any services rendered thereat." Several railway Bills now before Parliament contain clauses empowering the companies to charge for a long list of special services, the enumeration concluding with the words "and for any other accommodation or service of whatever kind." If similarly unlimited powers were possessed by all lines with regard to both "handling" and "station" terminals, it is doubtful whether they would not take an undue advantage, for, to say the least, they entertain ideas as to reasonableness differing very widely from those of the public.

There are six clauses relating to canals, and we are quite prepared to give the Government credit for a bold and vigorous policy in this respect. Detailed returns are required from all canal companies, showing the accommodation they are capable of affording, and the state of efficiency they are in, also reports of any intended stoppage. Provision is also made for the inspection of canals by officers of the Board of Trade, and the Department are to be furnished with copies of all by-laws, lists of tolls, &c., for their approval. Clause 36 prohibits any railway company or officer from applying any of the company's funds to the acquisition of canal property or interest, under very heavy penalties, and if this part of the Bill becomes law it will prevent any further development of what Mr. Mundella has described as the "throttling" of canals which compete with railways. It is, of course, too late to remedy the evils already existing, and it is useless to complain that the Bill is not retrospective, seeing that the canal property which is already in the hands of railway companies was acquired when they were unfettered by any such prohibition, and were free to take any course which they might consider to be conducive to the prosperity of their own undertakings.

The companies are naturally preparing to resist such clauses in the measure as point to a curtailing of their privileges, though it is to be hoped that they have modified their opinions as to the justice they may expect from Parliament, and will approach the subject in a more temperate attitude than they did last year. At one of the "anti-confiscation" meetings, a speaker said that there were now a larger number of Members of Parliament who had no great stake in the country than at any previous time, and that the House was hardly capable of taking a proper view of the question. Although loudly applauded when uttered, we do not think this opinion was seriously entertained by the majority of railway shareholders after the excitement occasioned by exaggerated statements had worn off, and we trust that a calm discussion of the new Bill may result in a beneficial railway reform.

KUGLER'S HANDBOOK OF PAINTING.

ALTHOUGH the Handbook of the Italian Schools of Painting, "based on the handbook of Kugler," has been edited and re-edited, and received many additions from various hands, its reappearance from time to time in these more or less modified forms is a tacit testimony to the soundness of the original work. It is only in the case of a book that has been well done to begin with that it is worth while to make those periodical revisions which are required to bring it up to the date of the most recent criticism and investigation. And in its main characteristics Kugler is a model handbook of the kind. It is just the right size for a handbook, not unwieldy, giving the historical outlines of its great subject in a concentrated and business-like manner, not wasting space with irrelevant analysis or enthusiasm, but weaving into its historical record just enough of criticism on the leading schools and their leading names to vary the baldness of historical narrative, and to render the treatise to some extent suggestive to the imagination and fancy of the reader as well as instructive to his faculty of acquiring and retaining facts and dates. The small but careful outline illustrations, increased to nearly the number of 250 in the present edition, form adequate memoranda of the works referred to, and are sufficiently explanatory of the descriptions and remarks in the text, without laying any claim to an actual transcription of the artistic quality of the paintings, which would be impossible on the scale, and within the restrictions as to cost, of a popular handbook.

The English form of the work, itself a modification of the original, has passed through several hands, so that it is rather difficult now to assign to every one his or her part in the fifth and latest edition. The German original, "Handbuch der Geschichte der Malerei von Constantin dem Grossen bis auf unsere Zeit," was published at Berlin in 1837. In 1851 a translation of the portion relating to the Italian schools was published in England under the editorship of Sir Charles Eastlake. Since then the labours of Messrs. Crowe and Cavalcaselle added so far to the available knowledge of the lives and works of Italian painters as to render a new edition desirable, and this was undertaken by Lady Eastlake in 1874. The present edition (the fifth) is revised and partly rewritten by Sir Henry Layard.*

The present editor's main reason for the appearance of the present edition is the publication, since Lady Eastlake's edition, of Signor Morelli's work "Italian Masters in German Galleries," first published under the assumed Russianised name of "Lermolieff." The appearance of a work which has brought so much new knowledge to bear on the subject, and unsettled so many old convictions, would alone, in the eyes of the present editor, have rendered a new edition of the handbook necessary : the proper object of a "Handbook" being, of course, not to investigate or propagate new views, but to place in a compact and condensed form the accepted views of the best authorities. In addition to this, many pictures have been removed from the sites in which they were originally referred to in the Handbook, to local galleries and museums, which changes of place require record ; and, last, but not least, our own National Gallery has of late years received such numerous and important additions as to call for revised notice and description. Sir Henry Layard, who is a Trustee of the National Gallery, adds a note in regard to this regretting that the want of space in the National Gallery "and the defective construction of the building itself, considering the purpose for which it was intended," render a complete systematic and chronological arrangement of the pictures, according to schools, impossible. We quite agree with him in thinking that the want of such arrangement of the pictures on a definite system is a great misfortune ; but we should like to understand exactly what he refers to in regard to the defective construction of the building. The National Gallery has grown up in a rather piecemeal manner ; but when the last important additions were made, did the authorities suggest to the architect any systematic scheme of arrangement for which the building should be planned and prepared ? And if not, whose was the fault ? Or does Sir Henry mean to express his regret at the cheeseparing policy whereby the projected rebuilding of our National Gallery, on a scale and in a manner suitable for its important functions, was put a stop to ? If so, we are entirely with him.

The critical judgments expressed in the book are mostly still those of Kugler, coloured more or less by those of his former editor, Sir Charles Eastlake, and accompanied by occasional expressions of dissent or modification through the medium of the footnotes of the present editor, though these marginal suggestions of difference are but few. But an important modification has been made in the classification of the subject. The old division into "Periods of Development" has been discarded, and the chapters deal successively with the characteristics of the most distinct styles and schools of painting, as divided or grouped by chronology or topography or both ; the Byzantine style, the Romanesque style, the Florentine school, the Umbrian school, &c. "Hard-and-fast lines," the editor truly remarks in his preface, "fixing periods of development, are not to be drawn in the history of art. They can at best be but arbitrary and scientific." The editor suggests the adoption of Morelli's classification ; the "heroic" period, in which the religious

* Handbook of Painting. The Italian Schools. Based on the Handbook of Kugler. Originally edited by Sir Charles Eastlake, P.R.A. Fifth edition, thoroughly revised and in part re-written by Austen Henry Layard, G.C.B., D.C.L., &c., with nearly 250 illustrations. 2 vols. London : John Murray. 1887

sentiment is dominant, and paintings of sacred subjects are made for the encouragement of piety; the second period, in which the artist gave himself to the study of anatomy and perspective and to the closer imitation of nature, and which Morelli terms the period of "character"; and lastly the period of "Renaissance," in which the technical processes of painting reached their highest perfection. The first of these periods, that of the especially religious art, where the interest consists not so much in the execution of the painting as in the sanctity and significance of the figures or the event which it represents, is, no doubt, traceable in the early period of all national art in which the representation of the human figure is concerned; and the distinction between the painting made for a purely religious purpose, and the painting made for the sake of artistic beauty and intellectual enjoyment, is one of the broadest and most marked distinctions which the history of art can show. But for the other two of Morelli's divisions, as summed up here, they appear to us pretty nearly as arbitrary, and as capable of misapplication, as any others that have been made. A classification of some kind, no doubt, assists the study of the history of an art, or the writing of the history, at all events; but with the exception of the broad distinction, just alluded to, between subjective and objective art, all these classifications depend on the point of view from which we choose to consider the whole subject, and what is true for one student or for one view of the subject is incomplete or misleading for another.

The minor divisions into local schools during a certain period of Italian painting are, of course, by no means arbitrary, and their well-marked distinctions afford a good suggestion for grouping the subject into chapters in dealing with this portion of the history. The strongly-marked local characteristics in the early period of Italian Renaissance art are of curious interest, and, occurring in regions so little removed geographically from each other, tell an unmistakable tale of the difficulties of communication, and the conservative jealousies of the small States, in the Italy of that period. As Sir Henry Layard remarks, "The connexion between race and art would form an interesting subject for study and investigation. The zones in which the fine arts have flourished, and those in which the populations have no natural disposition for them, might almost be marked out geographically on a map of Italy."

Concerning the larger business of mapping out chronologically the epochs of Italian painting and their achievements and characteristics, which is the main object of the Handbook before us, space would not serve here to speak at length, nor is it necessary, beyond remarking that whatever changes and modifications have been made in the literary form of the present edition, they are such as tend towards increasing its efficiency and usefulness as a *vade mecum* and book of reference. It is impossible, of course, not to reflect, in turning over even such an outline of the subject as can be given in a handbook of this size, on the extraordinary and varied interest of this long history of the use of the faculty of pictorial representation in one region only of the modern world. The study suggested is not merely that of the various technical means of pictorial representation, and their use and development, but of the intellectual attitude of the Italian mind, at various stages of its career, towards the scenery presented by the outer world; the spectacle of human life and of the landscape in which it is framed. Nothing in the critical portion of the book is better than the characterisation of the once widespread Byzantine school, that gilded mummy which kept up for so many generations the solemn semblance of life, and in which, as Sir Henry Layard puts it, the worn-out forms of the old world were found embalmed for the benefit of posterity. The gradual awakening of this dead art, the stirring of these dry bones under the first breathings of the new life of the early Renaissance, forms a chapter in the intellectual history of mankind, which has an interest quite beyond what are usually supposed to be the limits of artistic history. The distance from the Byzantine art to that of Raffaelle is like a voyage to the intellectual antipodes of the subject. In the former, the art is the obedient and formal handmaid of a church whose own life was almost smothered in the bonds of ceremonial; in the latter, art is freely walking her own path, breathing her own atmosphere, taking her forms and inspiration from human life, and only affecting a kind of traditional respect for a church which, from being the mistress and director of art, is now suing to the great painters of the day to decorate her churches according to their own tastes and intellectual aspirations, and ready to take thankfully what they are pleased to give. Something of reverence and earnestness may have been lost, no doubt, in these times of Pagan joyousness and energy of artistic life; but it was *life*, at all events, and the Byzantine art, however rich in its trappings, represented but the formal lying-in-state of the dead body of the art of the ancient world.

Among the critical portions of the second volume, the extremely just and well-balanced view taken of Titian's genius may be commended to notice; doing full justice to its intellectual greatness, while not blind to its spiritual coldness and want of sympathy with the pathetic side of human life, of which, indeed, the princely and pleasure-loving Venetian master must have seen and known but little. The estimate of Tintoretto as originally given is retained in the text, but protested against in a note, as doing inadequate justice to a painter whose great qualities have been better recognised since the earlier editions of Kugler were published. The actual estimate of Pordenone attaches more importance to his work than the popular mind has yet realised, but we believe with justice. One may note, in the grand design of the altar-piece from S. Giovanni Elimosinario at Venice, given as an illustration of his manner, a remarkable similarity to the style and feeling of some of Blake's figures in the attitude and lines of the figure of St. Sebastian on the left of the picture.

In the preface to the present edition special attention is drawn to one deplorable subject,—the extent to which many of the works of the great masters of Italian painting have been "restored." It is painful to read that "the celebrated altarpiece of Titian in the Church of the Frari, with the portraits of the Pesaro family, has, it is believed, been restored seven times" (!). The Italian authorities have systematically employed persons in their galleries for these abandoned purposes, and are now beginning to find out their mistake after the mischief has been done, and when that has been taken away which no Government and no funds can restore.

NOTES.

IT is not without uneasy feelings that we read in the daily papers that "several applications have been received from Schools of Science and Art in the colonies and dependencies of the United Kingdom to ally themselves with the Department of Science and Art, and to have the benefit of its examinations," and that arrangements are in progress for having a still further centralisation of art-examinations, in regard to work from the colonies as well as from the provinces. No doubt the aims and aspirations of the colonists are most praiseworthy, but if they knew the opinion of many persons in this country as to the deadening effect of this artistic bureaucracy, they would perhaps think twice about their move. What we should desire would be to see the colonies striking out new lines of their own in art, under new social and climatic influences. As it is, we seem threatened with having the whole of our dependencies turned into one big machine for grinding art on the approved South Kensington pattern.

THE Metropolitan Board of Works have resolved to apply to Parliament to allow of an appeal to the Appeal Committee of the Board (which is a Committee of the whole Board) in the case of dispute with regard to the decision of general lines of buildings by the Superintending Architect. It was not stated in what form the sanction of Parliament will be sought, but, judging from the past practice of the Board, they will probably seek to effect the alteration they desire to make by means of a clause in an Omnibus Bill, as, since the defeat of the Metropolis Management and Building Acts Amendment Bill of 1874, the Board have not attempted any comprehensive alteration of the law, and have contented themselves with homœopathic measures of reform introduced in such a manner as to escape observation. In whatever form it may be introduced, it is very doubtful whether Parliament will acquiesce in such an amendment of the law, looking to the fact that the present machinery has worked satisfactorily for the last twenty-five years. The Select Committee to whom the Board's abortive Bill of 1874 was referred reported emphatically that it was not desirable to alter the language of the existing Acts in any case in which the necessity of an alteration has not been demonstrated by experience. The Chairman of the Board was a member of this Committee, and will find a difficulty in recommending Parliament to adopt a change, not merely of language but of principle, dealing with a matter of great public interest in face of this declaration and his own acquiescence in the report of the Committee.

IN the discussion (reported in another column) that took place at the Metropolitan Board of Works on the 5th inst., with reference to this question, a suggestion that the appeal should be to the Royal Institute of British Architects was received with derision. The majority of the Board appeared to be of opinion that the duty of deciding general lines of buildings was the easiest thing in the world, in which view they differed from Lord Selborne, whose opinion on the subject we quoted last week, and this, from the constitution of the assemblage, was only what one might expect. One member went so far as to say that he considered the Board to be quite competent to decide general lines of buildings for themselves, it was only a matter of common sense. It was stated in the course of the debate that out of 337 decisions given between the years 1863 and 1886, there were only twenty-five cases in which the decision of the Superintending Architect had been disputed, an average of one case a year. We notice that several of the daily papers which are not usually particularly enamoured of the Board and its doings commend its action in this matter, and give their reasons for such commendation. The very statement of these reasons is sufficient to invalidate the judgment arrived at by the writers. We have often noticed that the glibness with which the daily journalist comments upon matters appertaining to architecture is in an inverse ratio to his acquaintance with the subject.

ACCORDING to the *Times* of Saturday last, "The Duke of Westminster, the Archbishop of Westminster, Viscount Falkland, Viscount Lewisham, M.P., General Lord John Taylour, Lieutenant General Sir Gerald Graham, V.C., K.C.B., Sir Frederic Leighton, P.R.A., Sir James D. Linton, P.R.I., and the Mayor of Croydon are among those who have already joined the National Committee for the maintenance of the Crystal Palace as a national institution." That is all very well, but do these good people understand that in that case they must begin by making the building such as would render it a permanent national possession? And how are they going to accomplish that, unless by rebuilding it in a more monumental manner?

FROM Mr. Plunket's reply to a question asked on Monday last, it appears that the exclusion of fog from the House of Commons by special appliances is contemplated. The First Commissioner of Works on that occasion stated that during a November fog many years ago Dr. Percy made an experiment of filtering through cotton wool the air which was supplied

to the House of Commons from the Commons court, and that it was so far successful as to impress him with the hope that by this kind of filtration the interior of the House of Commons might be rendered fog-proof at but a trifling expense; but that before applying this process of fog filtration to the interior of the House of Commons it would be necessary to make preliminary experiments, and Mr. Plunket had asked him to make such experiments on the earliest convenient opportunity. As the Smoke Abatement Society has not yet succeeded in abolishing the London fog, according to the hopes which it somewhat rashly held out to a suffering public, there seems to be here an opening for a new industry in London in the manufacture of fog-filters.

IT appears that on Friday, last week, Mr. Conybeare, of all persons in the world (or in the House), asked the First Lord of the Treasury why there were so few architects invited to compete for the Imperial Institute, and why "no competitors had been selected from Liverpool, Glasgow, Manchester, Birmingham, Leeds, and other great representative towns." We are also of opinion that there should have been at least an open sketch competition; but we fear we can hardly regard Mr. Conybeare's question as evincing any interest in getting the best architecture possible.

—"Timeo Danaos et dona ferentes"

is the feeling it awakens on our part; it is probably only a move on behalf of some provincial constituent, of the pure Radical faith.

THE demolition of some old tenements which formed the southern side of Bleeding Heart-yard has quite altered the aspect of a quarter which Charles Dickens rescued for a while from obscurity during the publication of his "Little Dorrit." The buildings in question stood against the end of what was once Union-court, and the blank wall that blocks off Ely-place, Holborn. Union-court, site of Scroope's Inn, formerly opened into Charles-street, — ever memorable as the home of Joseph Strutt, author of "Sports and Pastimes,"—and was rebuilt about fifteen years ago as Viaduct-buildings. The steps leading down hence into Great Saffron-hill, locally known as "The Hill," are indicative of the court's elevation above the course of the River Fleet. It is to be observed that the sign of the tavern in Charles-street, by the yard corner, is with easy impartiality, spelt both as Bleeding Heart and Bleeding Hart. The origin of the name is doubtful. Some may derive it from the sweetly-smelling dark red wall-flower, the "bloody warrior" of Norfolk and Dorset peasantry, and which in our Midland and Western counties is frequently known as the "bleeding heart." In his Poems of Rural Life, in the Dorsetshire dialect, the late Rev. W. Barnes gives a gloss on this name, whilst among the flowers of a cottage garden described in one of the poems he enumerates "jelli flowers" and "bloody wa'yors stained wi' red." Others connect it with the supposed tragical end of the Lady Elizabeth, daughter of Thomas (Cecil), first Earl of Exeter, wife to Sir Edward Coke, Attorney-General, and widow of the nephew and heir of the great Sir Christopher Hatton. That imperious and wayward dame, who never allowed her second husband to enter her house here, is said to have contracted her soul to the devil. The compact determined on the night of a grand festival (January 3rd, 1646) at Hatton House. The evil one accordingly joined the festivities in cavalier guise, and after treading a stately measure with his hostess, allured her into the garden, where he tore her to pieces. On this spot was found her heart, still beating; in the same garden, perhaps, wherein Richard, Duke of Gloucester, when, as he says, last in Holborn, had seen the good strawberries of my Lord of Ely. Yet the name of Bleeding Heart for this place would not appear to have been adopted before the middle of the eighteenth century. About thirty years since at Ufton, Warwickshire, the sign of the White Hart Inn was depicted as a white heart, or ace of hearts.

THE Metropolitan Board of Works have begun operations in pursuance of their Woolwich Ferry scheme. For this, the first free ferry to be established by the Board, have been acquired the sites of some premises, many of them perhaps 300 or more years old, in the High, Nile, and Surgeon streets, Woolwich. The Board have accepted the designs and tender of Sir W. Armstrong, Mitchell, & Co., of Elswick, for two steam ferry boats to carry foot passengers, cattle, and vehicles, each vessel to cost 10,050*l*. The boats will travel to a point on the opposite shore close by the North Woolwich Railway Station and the Pavilion Gardens, to which we referred in our last week's number.

WE are not aware what has been the result of the application of Messrs. Bucknall & Jennings, which appeared in our issue of the 26th ult., for funds to carry up an appeal from the decision of the County Court Judge at Swansea, who had allowed them less than 2½ per cent. as payment for taking out quantities. It may be well, however, to point out that a decision of a County Court Judge upon a question of amount is no precedent at all. One judge may think the amount of percentage is reasonable, another may fix it at some other figure. Again, if a Divisional Court of the Queen's Bench Division were to allow 2 per cent. or 1 per cent., that again would not form any precedent unless it was the logical result of a definite principle laid down by the Court. It has more than once been pointed out by us that the 5 per cent. remuneration usually paid to architects can only be obtained in an action at law if the judge or the jury considers it a reasonable sum. In the same way a charge by quantity surveyors, though it may be usual, is not one which can be recovered at law unless the tribunal considers it reasonable.

BETTER late than never! At last it has seemed good to the authorities of the Louvre that the two archaic "Apollo" statues from Actium should be published. They appear in the *Gazette Archéologique, année* 12, pl. 29. They were discovered by M. Champoiseau, then French Consul at Janina, in 1868. They are perfectly well known to every travelled archæologist, they are alluded to in every serious work on Greek sculpture, their importance in the history of archaic Greek art no one questions, and now, after nearly twenty years, they are accessible to the student in two good heliograph plates. They will now fall into their place in the familiar procession of the Apollos of Thera, of Orchomenos, of Perdicovrysi, of Tenea, and the Strangford and Choiseul Gouffier Apollos. The plate is accompanied by an interesting article by M. Collignon. He declines to settle the vexed question whether these familiar type are in reality Apollos or statues of athletes, or, again, funeral monuments. The two Actium figures, found, as they were, close to the precinct of Apollo, may reasonably be supposed to be statues of the god. On the other hand, they may be votive statues of athletes, victors in the Actium games (*τὰ Ἄκτια*). M. Collignon gives a list of the "Apollo" statues, and classifies them according to provenance. From his classification it appears that the type is common to northern and central Greece, the islands, and Sicily. So far no instance occurs in Asia Minor. The origin of the type has been matter for much discussion. It has certain analogies with Egyptian sculpture, but is marked by a naturalism and vigorous anatomy that differentiate it. M. Collignon suggests that the "Apollo" stone statues are copies, or, rather, developments, of more rigid wooden originals, and that these originals were themselves conceived under Egyptian influence.

THE same periodical (*Gazette Archéologique*, pl. 37, 38) publishes two interesting terra-cottas from the collection of MM. Rollin et Feuardent. The first, which is of very delicate workmanship, represents Pan seated by the side of a Nymph in front of a term of Priapos. The Nymph, in play or in self-defence, seizes Pan by the right ear. Probably to the nymphs, as well as to the "reverend graces," Pan was, as Pindar says, a "darling joy" (*μείλημα τερπνόν*). The second terra-cotta has a more serious subject, the rape of Cassandra by Ajax. Cassandra is not, as she usually appears on vase paintings, clinging to a temple image, but simply seated on an altar, Ajax catches her by the hair, but her face betrays but little of terror, his still less of ferocity. There is a manifest intent to euphemise the scene. The figure of Cassandra is of quite disproportionately small size, but the same may be said of all the black-figured vase representations. This seems to have been a traditional means of emphasising the helplessness of the victim.

A CORRESPONDENT has favoured us with a circular emanating from a remote little place in Devonshire, where a committee has been formed for erecting a cottage hospital, the cost of which is "limited to 1,200*l*., including all sanitary, heating, cooking, and lighting apparatus and fittings." Other requirements of the Committee are that "the plans, *specifications, and bills of quantities*," are to be sent in by a certain date named. (The italics are ours.) The Committee further announce that they "will pay for *no* plan," although they add that "the architect whose design is accepted will be paid the usual commission of five per cent. on the outlay, to include all his expenses." Nothing is said about the appointment of a professional assessor. From the fact that the copy of the circular which has reached us was sent to an architect in Liverpool, we suppose it has been pretty widely distributed, but we can only express the hope that the response to it will be as limited as the conditions deserve.

THE opponents of the erection of the proposed Dust Destructor at Notting Hill, by the Kensington Vestry, whose empowering Bill has passed a Committee of the House of Commons, condemn the apparatus in extravagant language, but the experience of most of the large provincial towns in the Midlands, where efficiently-working destructors are in operation, often in thickly-populated districts, does not seem to warrant this unqualified condemnation. It should be borne in mind that the complete sewerage system of London renders unnecessary the objectionable general or mixed midden still to be seen in many of the large provincial towns, and that it is only, for the most part, the dry ashes and dust of the households and the streets which need be consumed in the destructor. The excreta goes away in the sewers, and the offal, fleshy, and other offensive animal refuse can be, as is already successfully done in several instances, conveyed to the country as manure, mixed with that quantity of dust and trade refuse which would make it conveniently carriageable. Owing to its low value as a manure, the metropolitan districts find increasing difficulty in disposing, except at a serious cost, of their dust. Even Chelsea, with its barging and railway facilities, finds that the cost of its dust disposal has nearly trebled within a very short time, so that, along with the other districts, it is forced to consider the question of the application of other means of getting rid of ashes and dry refuse. Almost all sanitary engineers are of opinion that destructors of an efficient and tried kind can be worked in a thickly-populated district without creating a tangible nuisance to the neighbourhood.

THE *Journal of Education*, commenting on the delay in opening Holloway College, states that it is reported that the delay has been occasioned not only by the difficulty of finding a principal, in the choice of whom the Council are much hampered by the founder's statutes, but also by a more substantial impediment, the absence of drains, a detail which the *Journal* observes that architects have a way of overlooking. This is a preposterous charge, which it is not worth while contradicting. That there may be some defects in the drainage of the College is only too probable, these occurring, as our readers know

only too well, in spite of every care on the part of the architect, but that there should be no drains at all is, of course, impossible. The *Journal of Education* may be able to educate itself on this point by referring to the *Builder* for July 3, 1886, p. 37.

ACCORDING to the San Remo correspondent of the *Times* (March 8th), the earthquake in that quarter has proved a practical critic of jerry building, and all the houses that have come fairly down are "of wretched construction,"—"mortar which one can rub into dust, all kinds of stone thrown together any way," &c., &c. If this is the mission of the earthquake we might even welcome it here. It would at least be a purifying influence from the point of view of true architecture, though to throw down all the jerry-built houses in London would, perhaps, be a task beyond the powers even of any average earthquake.

CROYDON PALACE.

CROYDON PALACE for more than a century has ceased to be a residence of the Archbishops of Canterbury; but, although it has very much fallen into decay, and has been converted to secular purposes, the largest portion of the structure still remains,—more than enough to enable us to form an idea of its extent and magnificence in days gone by. In a paper on "The Architecture and Heraldry of Croydon Palace," by the Rev. J. Cave Browne, read last year at a meeting of the Surrey Archæological Society, the author remarks:—"Happily, at the present time Croydon Palace is not a ruin; may it never become one! Its once palatial walls are alive with what the poet calls 'reverent history'; for in their very massiveness and range we may read the tale of the piety, the perils, and hospitality of the so-called 'Dark Ages' in which they arose."

The most perfect part of the group of buildings at Croydon is the Hall, which was built in the fifteenth century by Archbishop Stafford, on the site of an earlier structure, which probably owed its original foundation to Stephen Langton in the earlier part, or to John Peckham towards the close, of the thirteenth century. Both of these prelates in their day were great builders; and they were great benefactors to the old manor-houses appertaining to the see of Canterbury. Ducarel, in his account of the Old Palace at Croydon, says that the manor, as is known from "Domesday Book," belonged to the see of Canterbury ever since the days of Archbishop Lanfranc, who became primate a few years after the Norman Conquest, and died in 1089. When the Manor-house was first built cannot be ascertained with certainty; but its origin is generally attributed to Archbishop Langton, in the time of King John. Be that as it may, there are few Archbishops between the thirteenth and eighteenth centuries with whom the ancient palace cannot establish its connexion. The palace was probably much enlarged by Courtenay and Arundel in the beginning of the fourteenth, and found its most munificent restorer in Stafford in the middle of the fifteenth century.

The palace, substantially almost unaltered, stands on the south and east sides of the parish churchyard, and through its moat ran, formerly, a clear stream that abounded in trout. Previously to its partial demolition, the buildings formed a large square court or quadrangle, and comprised, besides its banqueting-hall, guard-chamber, long gallery, and chapel (all of which are still standing), various ranges of apartments for the servants and retainers, &c. The hall and adjoining offices, which remain, are built of stone; the rest of the apartments are mostly cased with red brick.

The great hall, with its fine, open-timbered roof, is still in good preservation; but "the dais, on which the lord of the mansion and his guests were wont to sit in days when the proudest noble deemed it no dishonour to eat his meals in the common hall with the humblest of his servants, has disappeared." The arms of Archbishop Stafford (1443–52), which appear conspicuously on the corbels below the windows, prove that it was built by that prelate. The withdrawing-room,—generally, though erroneously, styled the guard-chamber,—with its fine oriel window, owes its construction to Archbishop Arundel (1396–1414), the friend of Bolingbroke, whom he crowned as Henry IV., and so is about half a century earlier than the present hall. The earliest mention of a chapel in the Palace of Croydon was in 1283, at which date Archbishop Peckham held an ordination within its walls; both Cranmer and Ridley are known to have officiated in that chapel. On the knobs of the oak benches at the west end of the choir are carved the arms of Archbishop Laud (1633–1660), who was in the building when intelligence was brought him of the assassination of his friend, the Duke of Buckingham. The arms of Laud's successor, Archbishop Juxon, who attended Charles I. on the scaffold, adorn the east end benches of the chapel; and it was he who probably caused the arms of his predecessors to be sculptured there along with his own.

Although, as stated above, among the heraldic decorations of the great hall, the arms of Archbishop Stafford are the most conspicuous, still it must not be overlooked that there are evidences of an earlier building. Two lancet windows, which formerly pierced the flank gable at the east, but were lost in the fall of the entire eastern wall in 1830; the Decorated porch on the north, with its finely-groined roof; the corresponding garden door and doorway on the south, clearly must have belonged to a building of earlier date, which Stafford probably found in partial decay, and restored with his wonted liberality. Though inferior in size and grandeur to the hall of Lambeth Palace, that of Croydon is a building of goodly proportions, being nearly 60 ft. long by 48 ft. wide, and it is divided into four bays, each containing a three-light window, except the eastern one on the north side, where the space is occupied by a small room over the entrance porch; this was used either as a minstrels' chamber, or as a passage room to a minstrels' gallery running along the eastern wall over a wooden screen. Under the screen were, no doubt, the three usual doors, leading respectively to the buttery, the kitchen, and the cellar; but along with the downfall of the eastern wall, gallery and screen and doorways have all disappeared. To the windows in their present mutilated form it is scarcely possible to assign even an approximate date; for crowbar or chisel and mallet have effectually removed all trace of cusp and curve, and left only the bare battered mullions, while the widening and less pointed arches and mouldings of the windows themselves may indicate any part of that vague period of transition between the Decorated and Perpendicular, which would comprehend the styles both of Courtenay's and Stafford's times. The roof, however, remains uninjured, with its wide-spanned tie-beams of Spanish chestnut, its arched principals without kingpost or brace, and its timbers open to the very roof, resting upon what constitutes the great beauty of the hall, a series of angel corbels, supporting shields, once rich in heraldic blazonry. Conspicuous among these, at the western end, as stated above, are the arms of its chief restorer, if not rebuilder, Archbishop Stafford, which appear singly,—a chevron, with and without the mitre of difference, and also per pale with those of Canterbury and of his former see of Bath and Wells; while on the neighbouring shields are the arms of his noble kinsmen, Henry, Earl of Stafford, and Humphrey, Duke of Buckingham. On the more eastern corbels are also the arms of Laud, Juxon, and Herring, who were the more recent restorers of the building.

At the upper end of the hall, in the centre of the dais, once stood the stone chair or throne used by the archbishops on State occasions, over which projected a canopy of stonework of massive proportions and remarkable construction. In front, upon a square panel between angel supporters, is a shield bearing the arms of Edward the Confessor impaling the royal arms, England and France, quarterly,—a device which would itself assign it to the reign of Henry VI., who proclaimed the Confessor the patron saint of England. The angel supporting the whole carries a scroll inscribed, "DOMINE SALVUM FAC REGEM," and rests upon a shield bearing the arms of Archbishop Stafford; while in the north angle of the projection is a shield bearing the family chevron without the mitre, and in the south angle the saltire of the see of Bath and Wells. This massive block of stonework fell down in the middle of the last century, and apparently destroyed the seat for which it had served as a canopy. Archbishop Herring (1747–1757), anxious to preserve it as a strange, yet historic, device, placed it on its present plain basement of masonry, close against the west wall; and although layers of yellow wash have quite obliterated all the rich colour with which the angels and the shields were bedecked, the faces and figures, as well as the heraldic changes and the general character of the whole group, have been remarkably well preserved. At the southern end of the dais is a shallow recess, with the usual oriel window, not unlike that at Hampton Court Palace. It is only fair to add that while this building was used as a bleaching factory, the greatest care was taken by its occupiers, Messrs. Oswald, to protect these exquisite corbels and the other architectural details from injury; and if they should be repainted heraldically again it will be found that they have not been injured, but preserved, by successive coats of whitewash.

The withdrawing-room or guard-chamber, has been utilised as a dwelling-house. This part of the palace, "judging by its heraldry," remarks Mr. Cave-Browne in the paper above mentioned, "was clearly the work of Arundel; yet, possibly," he adds, "if we read aright the arches of the stone* roof, his was the honour of completing the work designed by his predecessor, Courtenay. There can be no doubt that an apartment of imposing dimensions stood here previously, though known by a different name; for it was *in principali camerâ sui manerii de Croydon* that Peckham received the pall 600 years ago, and above a century before Arundel, or even Courtenay, succeeded to the primacy. It is probable," he adds, "that the need of a guard-chamber was the more fully realised by the soldier-minded Courtenay when he was appointed custodian of no less distinguished a prisoner than the young Duke of Rothesay, afterwards King James I. of Scotland, who had been captured at sea while flying to France to seek an asylum for his unscrupulous uncle, the Regent, Duke of Albany. From the rigours of his first imprisonment in Pevensey Castle he was transferrsd to the milder guardianship of the chivalrous Primate at Croydon, where he lived for some years." In this apartment, or in the great hall, how many historic scenes have been enacted! More than once the pall, brought fresh from Rome, has been placed here on the shoulders of the successors of St. Augustine; and royal and other illustrious personages have doubtless been entertained with music and dancing, and masques and revelry.

The chief gem of this withdrawing-room is an oriel window, which once looked out into a small quadrangle, but now commands a view over only a few tiled roofs of offices. It was formerly enriched with painted glass, which exhibited the arms of England and of the illustrious house of Courtenay.

On the south, close to this once noble chamber, ran the Long Gallery, in which Queen Elizabeth delighted to dance "galliards" with her courtiers, and in 1687 she is recorded to have here bestowed the Great Seal of England on the handsome and courtly Sir Christopher Hatton. The Long Gallery is still intact, so far as concerns its outer walls; though it has been cut up internally into a variety of bedrooms and sitting-rooms. At its eastern extremity is Queen Elizabeth's State bedroom; but its oak panelling, its ornamental ceiling, rich with heraldry, and the rest of its decorations, are entirely gone. The whole of this chamber and of the Long Gallery was cased in solid red bricks by Archbishop Wake, more than a century and a half ago. Its windows looked out upon the Archbishop's private gardens and "pleasaunce," now turned into a field.

Beyond the "guard chamber" is another large apartment, a century older still, if we may judge from its plain-timbered roof, which is still as sound and good as when it was first erected. It is divided into two parts by a floor; and the upper part, which has an opening looking down into the guard-chamber, is commonly known as "the music gallery." It may, however, be doubted whether this name is correct: possibly it was used as a dormitory for guests.

A slight wooden gallery, apparently of the sixteenth century, connects this part of the buildings with the chapel, which in its internal arrangements is very like the chapels of some of the smaller colleges at Oxford and Cam-

* The roof is not of stone; the original timber roof remains above the modern wagon-shaped ceiling which conceals it from view, and which has been painted a dull stone colour.

bridge. The Tudor arches of the windows mark the approximate date of the present building, which doubtless superseded a previous structure. The whole of it is cased in brick; but the brickwork is very finely executed, especially at the west end, which looks into the parish churchyard, where the Keys of St. Peter are worked into the wall in black brick very conspicuously. It is said that the chapel, as it now stands, is the work of Archbishop Bourchier, but all papers and documents relating to its foundation and erection have long since been lost.

"The existence of an earlier chapel," writes Mr. E. Walford, in his "Greater London," "is clear. Archbishop Peckham's Register expressly states that his reception of the pall took place *in camerâ principali*, and his confirmation two days afterwards *in capellâ sui manerii de Croydon* in the year 1382: and the learned but persecuted archbishop, Reginald Peacock, was consecrated in the chapel at Croydon in 1414. But it is with Laud that the present building is especially associated; for, according to his custom, and more fully even than at Lambeth itself, he has recorded here in heraldic characters the history of his rise. On the carved poppy-heads of the western stalls appear his arms in connexion with those of every preferment that he held, impaling the Principalship of St. John's College, Oxford, the Deanery of Gloucester, and the Sees of St. David's, Bath and Wells, London, and Canterbury, while on the eastern block are those of Archbishop Juxon."

This, however, is scarcely correct; for it would seem on a close examination that all the carving of the stalls in the chapel is of one date, and, if so, it must have been the work, not of Laud, but of his successor, Juxon.

From Laud's time the history of Croydon Palace is well known, and may be told very briefly. At the Great Rebellion it was confiscated and sold to Sir William Brereton, who turned the chapel into a kitchen, to gratify his own taste, for he is described in a pamphlet of his time as having "terribly long teeth and a prodigious stomach." Archbishop Juxon, as already stated, did what he could to restore the chapel to its former pious uses; but since his day it has received but scant care and attention. The Communion-table was removed in 1810, and the stonework and the carving of its windows were covered with stucco, plaster, and whitewash, while its stall-work and poppy-head carvings were daubed over with brown paint. Of late years it has been used, at one time as an armoury for the local militia, and at another as a parish day-school,—for girls, fortunately, as it is to be feared that it would have suffered still more cruel mutilation at the hands or from the penknives of the same number of boys.

Two meetings of local and metropolitan antiquaries were held in December last within the walls of the palace, at which Mr. E. P. Loftus Brock, F.S.A., explained with great care and minuteness the most interesting features of the building; and an appeal has been made by an active member of our two leading archæological societies to the patriotism of the people of Croydon not to allow such a building,—one of which they may well be proud,—to be swept away needlessly. The newly-enfranchised borough of Croydon has a population of between 90,000 and 100,000 souls, and the four or five thousand pounds which would be necessary to repair it and to convert it into a fit receptacle for a museum and public library, or into a training college for school teachers, ought not to be any difficulty to so wealthy a body of residents. We are told that the addition of a quarter of a farthing in the pound to the local rates would be ample for the purpose.

Manchester Architectural Association. The members of this Association visited the works of Messrs. Morrison, Ingram, & Co., sanitary engineers, brass and iron founders, Cornbrook, on the 4th inst. They commenced by going through the warehouse and examining the latest improvements in sanitary appliances, both in earthenware and metal. Mr. Ingram then conducted them through the iron and brass foundries to witness the casting. The process of both enamelling and decorating was next viewed, after which they passed on to the fitting-up and brass finishing and testing rooms. The visit was rendered most interesting and instructive by Mr. Ingram explaining the value and utility of every article and process.

EDINBURGH NOTES.

THE interest taken by the citizens of Edinburgh in the competitive designs for the municipal buildings is worthy of notice. Large numbers have visited the Waverley Market, where the drawings are placed, and their respective merits are keenly commented upon, not only verbally, but in numerous letters to the press. The designs as a whole are generally admitted to be of exceptional merit, but the variety of opinion as to the most suitable is wide. Although the design to which the first place has been awarded is considered to be in itself a refined and elegant composition, few who appreciate the unique character of the site and the traditions associated with it would like to see it occupied by "Edina Classica." Had the north side of St. Andrew-square been the spot selected (as at one time proposed), there would be little hesitation in accepting the design submitted by the Messrs. Leeming. But the old town,

> "Whose ridgy back heaves to the sky,
> Piled deep and massy, close and high,"

is not the place for a structure of this character. The visitor to Edinburgh who is possessed of æsthetic proclivities cannot but be struck by the rugged sublimity of the ridge of the High-street, as seen from the new town, and anything which would tend to destroy or modify this characteristic should be carefully avoided. Indeed, the north or back elevation is that which will attract most notice, and this fact has been kept in view by every competitor; but there is much variety in the treatment of the sky-line, a most important point in the present instance. Other competitors besides "Edina Classica" break the sky-line by means of a dome and subsidiary adjuncts, but a tower forms the culminating feature of most of the designs, and such would be much more suitable for the position, provided always that it did not compete with or overpower the well-known tower of St. Giles's Cathedral. To obviate such objection some of the competitors have placed the tower at the south-east angle, where it would be furthest removed from the Cathedral.

The exhibition of the designs has had the effect of weakening the former opposition to the proposal for new buildings, but not a few are strongly in favour of retaining the present buildings, with alterations and additions. "This building, known as the 'Royal Exchange,' was begun in 1754 by Lord Provost Drummond. It still stands out as architecturally superior to almost everything that has been done since in this city in the same style of architecture. It is designed in that phase of Italian that marks the middle of the Eighteenth Century, and as then used in Great Britain, it became distinctively national in feeling and application as compared with the same style and time in the other countries of Europe. Although simple and somewhat severe, there is a feeling of manly vigour about it; its detail and proportions are scholarly and elegant; it has a purpose-like look and much common sense, and it is most substantially built. It marks an important epoch in the history of Edinburgh, and the reign of one of our most energetic and far-seeing provosts; and I hold that Edinburgh would be distinctly poorer in interest and in architecture if this building were removed. The building is in the form of a quadrangle, but the north-west corner of it was never built." This quotation is taken from a pamphlet issued by the author of the design submitted under the motto, "Crescent in Shield." His scheme, he says, "provides for completing the north-west corner of the quadrangle, and for making an addition on the west side of it, a small one on the east side, removing the entire roofs and giving them a steeper pitch, and rebuilding all the chimney-heads; also for an alteration of the portico on the south side of the quadrangle." He closes his brochure by pressing his scheme strongly on the Corporation, for the following reasons:—

"First,—It will preserve to the City one of the best buildings we have, and the cost of taking down the present building on the site would be greater than the value of the old materials obtained.

Secondly,—A less amount of property will have to be purchased. It will only be necessary to acquire those parts of the quadrangle not belonging to the city, and the strips of old property on the east and west sides.

Thirdly,—The present quadrangle, if completed and re-arranged, will give all the accommodation asked for, and leave something for future increase.

Fourthly,—The cost of the scheme submitted will be certainly one-fifth, and probably one-seventh or one-eighth part of the cost of an entirely new building.

Fifthly,—The conduct of the business of the city would not be disarranged by having to remove to other, and in all probability more inadequate, accommodation than in the present building.

Sixthly,—The cost of hiring other buildings for probably eight years would be saved.

Seventhly,—The building operations will not interfere in any way with the city officials now using the present chambers. The east and west sides of the quadrangle could be taken in hand first, and as soon as completed, occupied. The minor alterations on the present council chambers can then be carried out, and the whole could be completed in three years."

This is all very well in its way, but, after all, the design thus submitted did not comply with the terms of the competition, and, strictly speaking, should not have been exhibited along with those which did so. The author seems to plume himself upon having struck out an original idea, but there are others to whom it also occurred, and who are equally entitled to consideration should such a scheme be finally resolved upon. The Town Council have resolved that a *plébiscite* of the electors be taken on the question whether the Municipal Buildings Bill should be withdrawn or prosecuted, and it was remitted to the Lord Provost's Committee to draw up the form of *plébiscite*, and report to a special meeting of Council.

MR. AITCHISON'S LECTURES AT THE ROYAL ACADEMY.

WINDOWS.

MR. GEORGE AITCHISON, A.R.A., delivered his second lecture* this session to the students of the Royal Academy on the 3rd inst., when he took for his subject "Windows." At the outset he showed that our word "window," or "wind's-eye," meaning a hole for the winds to get in, was directly derived from two Latin words, *ventus*, the wind (probably pronounced *wentus*), and *ocus*, the eye (the same as the Greek *okkos*), the old Latin form of *oculus*, which meant a little eye; and not from "windore," as Butler had it,—

> "Knowing they were of doubtful gender,
> And that they came in at a windore."
> *Hudibras*, pt. I., c. 2, line 214.

We had only to look at the houses we passed by daily to see that the bulk of the windows, when they were not mere holes in brickwork, both as to shape and dressings, came down to us, like the name, almost direct from Classic times. A window was much more complex in its relations than a doorway. Doubtless the earliest doorways were mere holes to creep in at, though they eventually became ornamental features of a building; but, big or little, their main uses were as exits and entrances for man. Windows were at first peepholes,—mere chinks or crannies for the safe observation of enemies, whether those enemies were men or wild beasts. They were, in fact, the loopholes of fortresses; and it was not until we arrived at a time when cities were defended by walls that what might be called "civil" windows were to be found. All early windows, too, were unglazed, and the exclusion of the wind, not to speak of cold, was certainly as important as the admission of sufficient light. Besides the consideration of cold, there was the exclusion of rain, hail, and snow in cold countries, and it was even more necessary to guard against these than to admit a due amount of light. And what was true of cold was true of heat. In hot countries, the exclusion of heat from buildings was one of the great problems. As soon as windows came to be glazed, the size of them depended on the size of the rooms and the country they were in, for the amount of light varied with its intensity. A very small opening would admit enough light where the light was intense. We in England were of course most interested in the quantity and quality of light we got here, and we ought to proportion our windows to the strength of the light and our own requirements. There were also other points to be considered. How should our windows be proportioned and disposed so as to get the greatest amount of

* For summary of first lecture, on "Doorways," see last week's *Builder*, p. 346.

light and effect from them? Too little attention had been directed in modern times to the æsthetic effect that could be produced by variety in the size and position of windows, so as to obtain gradations of light, shade, and shadow, particularly in structures built mainly for effect. By the word "window" the lecturer said he meant an opening for light in a vertical wall. There was a well-known hypothetical rule in England for lighting a room whose length, breadth, and height were in due proportion, namely, that 1 ft. superficial of unobstructed light would sufficiently illuminate 100 cubic feet of space. In the case of skylights under the clear sky of Italy, the Pantheon at Rome might be cited as an instance of the large proportion of cubic space that could be lit by 1 ft. of skylight. Taking the diameter roughly as 145 ft. 6 in., and the height as 147 ft., the dome being a hemisphere of 145 ft. 6 in. diameter, the cubic contents would be 2,041,711 ft. The eye was 27 ft. in diameter, the area of this being 572 ft. 6 in. The cubic contents lit by each foot of aperture were therefore 3,565 cubic feet. In R. Morris's "Lectures on Architecture, consisting of Rules founded on Harmonick and Arithmetical Proportions in Buildings" (London, 1734), he gave the following rule for lighting,—"If you multiply the height, length, and width of a room together, and extract the square root, this will give the real lighting area required." Suppose the room to be 20 ft. by 16 ft., and 12 ft. high, these dimensions multiplied together gave 3,840 cubic feet. The nearest integral square root was 62 ft., and that area, if divided into three equal windows properly proportioned, and placed at the end of the room, would sufficiently light it, *i.e.*, 1 ft. of opening lit 62 cubic feet. But as the square root would vary, that could not be a true solution, as a bigger room would get less proportionate light. For instance, let the room be 50 ft. by 30 ft. by 20 ft. high, the cubic contents would be 30,000 ft.; the nearest integral square root was 173. If the smaller room required to light it 1 ft. superficial for every 62 cubic feet, the larger room would be very dark if it had but 1 ft. of light to every 173 cubic feet. Mr. Aitchison quoted Viollet-le-Duc's remarks about windows, in his article on that subject. Those remarks the lecturer characterised as admirable, though the introduction to the article was in direct opposition to what was taught in optics, and, so far as the lecturer could judge, contrary to fact. In Gothic times, as far as churches were concerned, the one great aim of the architects was to convert the walls into picture galleries, and as fine stained glass produced the most gorgeous and entrancing effects, the problem was to make as much of the walls window as possible, by gathering together all the supporting and necessarily blank parts, and by lessening them as far as possible in size. In England, where so much of the stained glass had been destroyed, many of the more important late Gothic churches looked like conservatories; but when we saw churches abroad that had not been treated in that manner, but had preserved their old stained glass, we could not be surprised at that desire, as the effect was lovely; and when the eye was satiated with the beauty of the colour, there was amusement in deciphering the story. Strasbourg Cathedral was a favourable example of that, so far as the nave was concerned, but it was surpassed in grandeur by the effect of the earlier sanctuary, with the dark apse behind. It would be superb were it not that the apse had a small central window in it. We must, as a rule, go to the early churches before Gothic times to find studied effects of light and darkness, though there were some magnificent effects behind the choir of Westminster Abbey. At San Miniato, at Florence, besides the lovely and delicate tints that pervaded the church, whose resultant was a pearly greenish grey, the dark background of the choir set off the altar in light, just as some rich dark-coloured velvet set off a jewel framed in pearls. But the lecturer was not sure that the lighting was so well managed anywhere as at St. Mark's, Venice where floods of light came through the immense end windows of the nave and transept, while the aisles and choir were in twilight. Nearly all the temples of antiquity were now doorless, windowless, and roofless, but we could not help believing that the greatest care was bestowed in producing effects at once grand and impressive by light and shade. In the Temple of Diana at Nîmes a good effect was produced in one of the side passages by the middle of the vault being raised higher than the ends, so that the light came in by two lunettes. The lighting of ordinary rooms must naturally be more or less prosaic, for there the one thing wanted was to see. Still even there the architect might blunder. A long room that must be lit on the long side was often lit by two windows with a blank in the middle. That was a bad method of lighting, as a window in the middle, of the size of the two side ones, would light the room better, and would not be so offensive to the eye. The light should always be massed instead of being frittered away in morsels. Philosophers told us that cosmic energy was gradually dissipated in the making of dust. Some writers had praised the English Mediæval architects for making the east ends of their cathedrals square, and putting an enormous window there, and had blamed the taste of the French architects, who kept to the round end. To the lecturer nothing was so inartistic as the square end; there was no "mystery" in it, and in the morning nothing was more painful than to have one's eyes put out by a glaring light. He could not help thinking that the perpetuation of such a blunder must rather be attributed to the power of the corporation of glaziers, than to the want of taste of the architects, in Romish times particularly, when the high altar was the important feature. Even in houses, vistas could often be managed in halls, and looking from light to gloom, or *vice versâ*, was both striking and agreeable, not to speak of the cases where charming gradations of light could be obtained. *Apropos* of Viollet-le-Duc's remarks on the lighting of spaces, the lecturer observed that if the sizes of the windows were proportioned to the requirements of the rooms they were to light, the variety of the sizes would give great scope for architectural ingenuity. We did not now want to have the windows thrown haphazard over a front, as if they had been shot out of a cannon, and stuck. A few small windows well arranged gave scale to the large ones, and importance to the building. The Cornaro-Spinelli Palace might be taken as an example. Every architect must have noticed the absurdity of lighting in many modern houses, where two windows very imperfectly lit a large room, while a small room alongside was made almost as light as a conservatory, by having nearly the whole of one side taken up by the same-sized window. He (Mr. Aitchison) had seen cases where the large room got but 1 ft. of light to every 114 cubic feet, while the small one got 1 ft. of light to every 26 ft., though the big room was nearly three times as long as the small one, and though light varied in intensity as the square of the distance. There was, moreover, a feeling of satisfaction engendered when the outside of a house told us something of the inside, not to speak of its necessarily imparting its character to the building. Our fellow-workers in France said we gave ourselves no trouble about stamping their distinctive characters on our buildings,—that no one could tell whether a building was a court of justice, a hospital, a museum, a cathedral, or a school of art, by looking at its outside. Nearly all the Classical Greek remains that had come down to us were temples, public halls, theatres, and gateways, with the exception of a few tombs and monuments. We had no considerable ruins of palaces, houses, or other buildings, and the temples were mostly lit by some arrangement in the roof. At the Erechtheium, however, and at the Temple of Jupiter Olympius at Agrigentum, we had specimens of windows; those of the former building were like some of the simpler doorways, a frustum of a triangle with a kneed architrave; and in the latter building they were, as shown in Professor Cockerell's restoration, plain oblong openings with inclined sides. There was little doubt that Classic windows were generally protected by pierced slabs of stone or marble, or by wooden or bronze lattice-work, and by shutters. Vitruvius said little about windows, only that their height was to be equal to one and a half times their width. We knew, however, from the remains at Pompeii and Herculaneum that doorways, windows, and niches were frequently adorned with pediments both triangular and segmental, and sometimes with pilasters. From the pierced slabs already mentioned the Gothic traceried windows were no doubt evolved. In tracing the genealogy of the features of architecture, however, it must be borne in mind that the greater number of buildings erected had perished "by time, war, flood, and fire," and that as yet we had but imperfect notices of those that still remained. In conclusion, the lecturer urged his hearers to endeavour to solve modern architectural problems in modern ways, not by slavish adherence to old models. He was not, he said, idiot enough to suppose that some clever fellow could sit down one evening and invent a new style by the next morning; but he thought we had new wants which must require new arrangements. We had new materials which had revolutionised construction,—cement-concrete and iron to wit,—and both those materials had to be studied in order that it might be seen how they could be made available, particularly iron, which had to be rendered fireproof. Suppose, said Mr. Aitchison, you imagine that some sensible person wants you to build him a church, fitted for Protestant worship, and for a certain number of worshippers (when I say "fitted," I do not mean in the shape of a cross with a long central stem, in which the bulk of the congregation can neither see nor hear; nor one surrounded with mortuary chapels); that the founder means it to be filled with stained glass, and to be fit for use (in other words, that it is not to be a greenhouse); that for the structure nothing but iron and cement concrete should be used, so that the church should not be burned down if the seats took fire; and that the building was wanted to be decent-looking inside and out, and not Gothic. With such a programme you would have plenty of opportunity for trying new sorts of windows. As soon as the public begins to think about public edifices, they will want them arranged in the best possible way for the purpose they have to fulfil.

BALUSTRADES.

MR. AITCHISON'S third and concluding lecture was on "Balustrades," and was delivered on Monday evening last. The lecturer pointed out that the humble office of protection that balustrades fulfilled was by the genius of architects converted into the noble one of providing a new ornamental feature that gave scale, beauty, and finish to buildings, and that parapets and battlements were not distinguishable from balustrades, if the sense in which this word was used in France was allowed here, as French architects spoke of pierced and unpierced balustrades. With the exception of unpierced fence walls to stairs, balustrades were unknown to the Classics, who appear to have used fences of wood or metal when they did not use walls, and this practice appeared to have continued until the Christian architect built the mosque in Egypt for Ahmed Ibu Touloun in A.D. 885, and used pierced battlements. He explained the reason why the Mediæval architects substituted perforated slabs in one piece for the open arcaded balustrades built of small stones, viz., that numerous horizontal joints caused the balustrades to buckle, while the single slab was tongued into the cornice and remained firm. He traced the various forms of piercing used, and adverted to the practice of putting letters, names, or emblems in openwork parapets in the Mediæval work, which was continued by the Renaissance architects of France, and he pointed out the great skill used in designing the balustrades of the Francis I. staircase at Blois. He also dwelt on the beauty of the design and execution of the pierced marble slabs forming the balustrades round the altar of Sta. Maria dei Miracoli at Venice, and the persistence there of balustrades formed of small slender shafts, which came down from Mediæval times, until the introduction of the single and double-bellied balusters, which are now the favourite forms. He suggested that they were probably derived from the turned woodwork of the Saracens. The first illustration of double-bellied balusters he had found was in the first illustrated edition of Vitruvius of 1511. The first instance of the use of the word he had found was in Philander's edition of Vitruvius of 1586, where they are called "balustriæ" or "balustiæ," on account of their resemblance to the flower of the wild pomegranate, *βαλαυστιον*, Balaustium. In his remarks on the difficulties involved in the use of balustrades from an æsthetic point of view, as they could not be well less than 3 ft. high, he pointed out how admirably this difficulty had been solved by the architect of Ismael Pasha's fountain at Cairo;

the balustrade of the upper floor was divided into two heights, the lower half filled with panels of lattice work, while the upper half was composed of small arches, which gave scale to the open arches above them, but which would have been dwarfed had the balustrade been in one height. The lecture was illustrated by diagrams, drawings, and pictures, and with a large collection of photographs.

WELSH CHURCHES.

ARCHITECTURAL ASSOCIATION.

THE tenth meeting of this Association for the present session was held on Friday, the 4th inst., Mr. J. A. Gotch (President) in the chair.

Previously to the ordinary meeting a special business meeting was held, when it was unanimously resolved to amend Rule 3 by the insertion of the words, "a periodical publication," after the words, "classes and lectures for the study of specific subjects (Rule 4)."*

At the ordinary meeting held subsequently a paper was read by Mr. A. Baker on "Welsh Churches." After some introductory observations, the lecturer said,—

The flourishing independent state of the British church was exhibited when the college of Bangor Isacoed (numbering 2,000) refused to submit to the authority of St. Augustine when he came as the Papal Legate to solicit their assistance in evangelising the Saxons.

The British Church maintained its independence till the year 1175, when it submitted to the Roman Pontiff, who rededicated some of the churches to the saints in the Roman calendar, but the measure was so unpopular that he changed his plan and conciliated the people by canonising the old British worthies, and invested their memory with a halo of legendary miracles. But whatever objections they had to the rites and doctrines of the Romish church they had none to their architects who introduced the Norman style. I have noticed two varieties of plans in the small village churches of this date, the one a parallelogram, the other a nave and a chancel connected with it by a very small arch. In most churches where you now see modern chancel arches I think they have been substituted for these early arches. The disrespect in which the Normans held early British work is shown by instances having been found of their using the old British crosses for building materials, as, for example, the fragment found at Effenechtyd. Of the most beautiful examples of transitional work is the little church at Llanaber, near Barmouth.

Owing to the great destruction of church property which took place during the wars of Henry III.'s reign, the remains of Early English work are scanty. St. Asaph Cathedral was burned in 1282. This brought about reaction favourable to the church, and in 1284 certain clergy of the diocese of St. Asaph travelled through the country with the famous copy of the gospels belonging to the cathedral for the purpose of obtaining funds for its rebuilding, which was completed in 1296. The very beautiful double lancet choir window discovered during the restoration of the cathedral was most probably executed at this period. A general renovation of the churches ensued. I have some good specimens of the Decorative style then prevalent,—the arcade at Guilsfield and windows at Gyffylliog, Meifod, and at Llanrhaidr. Again troublous times followed. When Owen Glendower revolted, great injury was done to the churches. The fifteenth century was an era here as elsewhere of great church activity. In every parish may be seen evidences of work of this date, both in windows and roofs and other structural features, as well as in the screens, seats, and fittings necessary for the sumptuous ritual of the time. The rood-screens were of various types, some having flat lofts while others, as at Conway, are groined. Only a few of these remain, though every village church, however small, contains evidence of their existence in former times.

I was fortunate enough to discover in the restoration of Meliden Church that even the smallest churches were fitted with stalls similar in construction to those used in cathedrals. I have an illustration of a curiously-carved bench in Ruthin Church, which from its size and construction, I imagine it to have been a Litany stool.

One of the most beautiful architectural features of this period was the hammer-beam roof, of which many beautiful examples exist. That of Cilcen, a little village at the foot of Moel Famma, is especially fine, being remarkable for the great size and elaborate moulding of its timber. A local tradition says that this roof was brought from Basingwerk Abbey, but this may be doubted, as it does not bear any evidence of having been refixed. The panelled chancel-ceilings are very numerous in this district, of which there is a very beautiful example in Llanrhaidr, where all the tracery panels vary, and are of the most elaborate and delicate designs. At this period timber porches with panelled sides and carved barge-boards were placed over the entrance doorways; good examples of these are very numerous. The superstitious piety of the period is evidenced by a few remaining churchyard crosses, which were once universal. I exhibit a fine specimen from St. Donat's, Glamorganshire, and an equally beautiful one may be seen at Derwen, in Denbighshire. The existence of such beautiful and elaborate work in a poor mountainous district may be accounted for by the large sums of money offered to relics and the holy wells. A fragment of one of the most profitable of these relics may be seen in the porch of Llanderfel Church, at Bala. This relic was once a horse, made of wood and plated with silver, bearing on its back St. Derfel, the patron saint of the church. At the Reformation the saint was detached from the horse, brought to London, and burned at St. Paul's Cross. All that now exists is the trunk of this horse, in its present state highly suggestive of a child's dilapidated toy. The streams that abound in these mountainous districts were utilised as holy wells, some having small chapels built over them, as at Llandullo Ynrhos, while others were covered with most gorgeous erections, as at Holywell, where the Countess of Richmond, the mother of Henry VII., built a chapel of unsurpassed beauty; it is well worthy of a pilgrimage of all art devotees.

The outward signs of prosperity in the Church, as exhibited in building, appears to have continued as late as the Reformation, in Henry VIII.'s reign, when it suddenly ceased; and in Edward VI.'s time, when the energies of the Church seem to have been directed rather to education and the revision of the liturgy, little or nothing appears to have been done. I suppose that this was also the case in Queen Mary's reign, as the Church's entire time and exertions were occupied in the restoration of the decorations and ritual abolished during the previous reign. Elizabeth's reign was marked by a general repair of fabrics, but more especially of the roofs, as there are but few churches that do not appear to have been re-roofed at this period. These roofs were notable for a construction unlike any of previous date, the trusses being of unusual depth, and 5 in. in thickness, the timbers in the rafters and purlins very broad and thin, and the purlins strengthened with carved wind-braces, the advantage gained by the use of the broad timbers being to allow for the deep tenons. The covering consists of alternate thick and thin boards. These roofs are well worth a very careful study, as their good preservation testifies to the excellence of their construction. During this reign what is commonly known as Jacobean work was introduced in England, but I have not seen any of it in the Welsh churches which can be attributed to a date as early as this. In Charles I.'s reign a number of small chapels were built, upon many of which great sums of money must have been spent. That at Rüg, near Corwen is the most interesting specimen, and well worth a visit. In the construction of this chapel some of the materials of the desecrated parish church of Llanaelhairan were used, the fine hammer-beam roof being altered to fit the chapel, its timbers decorated with a rose pattern, and the date of its re-erection (1637) carved on the tie-beam. In addition to the Jacobean fittings there are now in the church very curious fifteenth-century benches. There is also a west gallery, which is the earliest example I have seen, and a chancel screen without a loft. Within the altar-rails are two canopied seats, remarkably like four-post bedsteads. In Gyffylliog Church there existed a framing which once carried a bell-turret, of which few examples yet remain. This one, as well as the porch, I regret to say, was destroyed by the present vicar.

In the time of the Commonwealth orders were given for the destruction of images, altars, tables turned altarwise, crucifixes, superstitious pictures, monuments and relics of idolatry, and commands were issued for the Communion-table to be placed in the body of the church. In 1643 there were orders for the sale of copes and surplices. In 1644 all images in the open air to be destroyed, and crosses removed from all plate. These orders were carried out except where private influence was sufficiently powerful to prevent them. Many fonts have been preserved for menial offices, as flower-pots and drains. I have found, too, that coal-holes were a favourite receptacle for the condemned ornaments.

In Llangynhafal Church, in the Vale of Clwyd, I saw some interesting seats in which were illustrated the art of planing. The earlier specimens being very rude attempts to plane on thick timbers; the mouldings and workmanship become more delicate and true as the timbers were decreased in thickness till the standard of 1¼ in. was reached.

At the restoration of Charles II. a spirited effort was made to put the churches into a fit state for worship, every church containing examples either of Jacobean seats, pulpits, or fonts. This was followed by the terribly uninteresting Georgian period, the age of plaster and "three-deckers," though I do not think one ought to say much against the three-deckers, as they were a necessity arising from the existence of galleries, which, at this time, assumed enormous proportions.

During the early part of the religious revival which ushered in the century there arose a feeling of the unfitness of the churches for public worship, and, owing to the ignorance of their value, it resulted in a terrible amount of destruction, which was happily, however, checked by the Gothic revival. I believe that if the labours of Pugin and Scott had been estimated at their true value, we should not have heard anything of the Association which, under the specious title of the "Society for the Preservation of Ancient Buildings," has misled so many.

Because many ignorant of Gothic art and church history have been allowed to lay their sacrilegious hands on our ancient monuments, an argument has been put forward that the only safeguard against further destruction is that they should be left entirely alone, and only such repairs effected as may from time to time be absolutely necessary.

Let us see how this will work out in practice. Let a church which is in a radically bad state of repair be tinkered up to suit the views of the society whose theory of preservation Time, which is the great destroyer, will, in the course of another generation, upset, and when in a succeeding generation this subject has faded from public view, and the school of architects trained to conservative restoration has died for want of patrons. What will be the feelings of an architect when he is called to view such a Church as Meliden, near Rhyl, and finding it apparently utterly devoid of all architectural features, the walls and ceilings a waste of plaster and whitewash? Would he not succumb at once to the appeal of the Vicar to "pull down" the ugly old place, and build a pretty new church? And the end of that church would certainly be destruction and not preservation. Now, what a loss to the diocese would this church, containing an unusual number of features of interest, be; for, having had the pleasure of restoring it, I found behind the west gallery some remains of the Early English west window, and the apex stone of the bell gable, of fourteenth-century date, was dug up. On taking down some rotten plastering, the different eras in the building of the church could be clearly seen by a comparison of the various kinds of masonry employed; the coursed masonry denoting the early thirteenth-century work, the work abutting against it being of the fourteenth century. This fourteenth-century work was done to repair the damage caused by the wars of Henry III.'s reign. At the east end there was evidence that it again suffered much injury, and was repaired in the fifteenth century, as all the eastern part of the church is of this date. When the north door was opened out, the old font was found buried in the wall. If this was done when the edict was

* The object of this alteration is, we believe, to enable the Association to start and carry on a small journal which it is thought may be useful as a means of communication between the officers and members.

made for the destruction of fonts, the church must have been without a font for forty years, as the present font bears the date 1686. In surveying this church I had to summon up all the faith I possessed in its hidden value, and you see how I was rewarded. If my faith had not been inspired by education and strengthened by experience, I am sure I should have given it up as worthless and have gone in for the "nice new church."

The last piece of experience I have to give you is that relating to the cost of restoration work, which I hope will be accepted as a weapon with which to meet "the nice new church" suggestion.

I have found that the cost of restoring village churches of ordinary type averages from 15*s.* to 1*l.* per superficial foot of the whole area of the church, the new fittings, if required, being of oak, and the roofs repaired with oak, and re-slated. Allowing 7 ft. superficial for every member of the congregation, this would make the cost from 5*l.* 5*s.* to 7*l.* per sitting. A new church could not be built for the former sum, and for the latter it would be a poor skinny affair, with thin walls, poor details, and deal roofs and seats, and to produce a church as substantial and elaborate as the old church restored would cost at least 12*l.* or 15*l.* per sitting, and it would lack the historical interest of the old building.

The Chairman, in opening the discussion, remarked that Mr. Baker's paper was a striking instance of the interest that might be extracted from such a subject by one who had thoroughly studied it. It was also an encouragement to architects not to think too lightly of a church which at first sight appeared to possess little interest for them, because even if there were a scarcity of sketchable work in it the building was pretty sure to be of some historical value. No apology was required in bringing forward the subject of any branch of architecture, and although it did not fall to the lot of every one to restore churches, they had still a little attention to spare for the description of such work. It was impossible to discuss Mr. Baker's paper detail by detail, but there were a few points he would like to refer to. One was that a great deal more blame had been cast upon the Commonwealth than it really deserved. He believed the great era of ecclesiastical destruction was at the time of the Reformation. He would like to ask Mr. Baker what he did with a "three-decker" pulpit when he came across one? Did he regard it as coming within the category of works that ought to be retained or did he abolish it along with the galleries? A great many "three-deckers" were very interesting and beautiful specimens of work, which he (the speaker) would be very sorry to see destroyed. He was pleased to think that in the present day the Gothic appetite was not quite so voracious. Some ten or twenty years ago, if a church possessed a beautiful Jacobean altar, or panel, or anything of the kind, or even a Georgian reredos, as at Kettering Church, it was completely cleared away, and common-place Gothic work put in its stead. No doubt this would be in keeping with the church, but it seemed to him that art suffered from the change, and he was therefore glad to think that, at the present time, people were not quite so mad on Gothic, or ready to regard a piece of Jacobean work as unworthy of retention. As Mr. Baker had forcibly pointed out, all these things were of interest in the history of the church, and could not well be spared. The real difficulty was to decide where the history began, whether with the "three-decker" or earlier.

Mr. Leonard Stokes, in proposing a vote of thanks to Mr. Baker, said he could not quite agree with that gentleman's views about church restoration. Mr. Baker had told them how he had restored several churches which seemed almost hopeless, and how after a good deal of trouble he had found out their whole history. But did Mr. Baker consider that, supposing any of his hearers went down to these restored churches, they would be able to find out their history, however much trouble they spent upon them? Had not Mr. Baker rather destroyed some of the history of those churches by restoring them so thoroughly? A few pounds per foot super. was spent over the whole church, the result being that though there was an admirable building, the history of it was more or less lost. Indeed, might it not be well in such cases to stipulate with the architect to write a history of the building, including an account of the restoration. He believed that in restoring a church its value was considerably lessened from an artistic and archæological point of view, because the restoration was so admirably effected that the difficulty was to tell "t'other from which." He was glad to hear the Chairman say a word for the "three-decker," which was undoubtedly a part of history. He agreed with the Society for the Protection of Ancient Buildings in thinking that restoration was much over-done. In dealing with an old church, as much of the old work as possible should be left, and he admired Mr. Baker's spirit in throwing up a job when he had firmly made up his mind as to the nature of the restoration, to which his client would not agree.

Mr. H. W. Pratt said he had studied the church work in South Wales, but his impression of North Wales was that there was very little architecture to sketch. It was, therefore, agreeable to learn from Mr. Baker that there was some interesting work to be found in that part of the Principality. Referring to the long narrow oblong churches, he would like to ask how, in cases where they possessed rood-screens and lofts, without signs of external staircases, access was obtained to the lofts? He would also like to know if any of the village churches still existing in North Wales had a separate chancel, or were built in one plan? Mr. Baker had given reason to show that the roof-work had been executed at a much later date than that of the type of design, but that would seem to show that the Welsh people had been much behind the English people. With regard to the question of restoration, Mr. Baker had shown in the buildings he had dealt with, that although he had acted in a very conservative spirit, he had also acted in a most rational manner. To retain "three-deckers," and leave the history of a church to speak for itself, in restoring, would be impracticable, while in restoration such as Mr. Baker advocated, by the mere fact of using the old materials and fittings, it was possible for the architect to write the history of the church in stone and wood, instead of on paper. He seconded the vote of thanks.

Mr. A. C. Bulmer Booth said that Mr. Baker had frequently mentioned oak roofs, but he would like to know if he had found chestnut used anywhere? At one time chestnut and oak were the two timbers used, deal not being obtainable then.

Mr. T. E. Pryce (Hon. Sec.) did not quite agree with Mr. Stokes in his remarks upon restoration, as a church covered with plaster and so on would not easily tell its history. Mr. Baker had shown them that there was a great deal to sketch in Wales. Wrexham Church, in particular, was a very fine edifice, but many of the small village churches were well worth inspection. Wales had also a great deal of half-timber domestic work to show, all along the Border. It was an undoubted fact that a great many of the rood-screens were destroyed in the time of the Commonwealth, and in his own native town of Welshpool the rood-screen, which had a reputation for beauty all over the country-side, was burned by Middleton's soldiers, while similar destruction went on in others. The date assigned by Mr. Baker to the common type of roofs in Wales seemed later than their form and detail bore out. Guilsfield, diagrams from which hung upon the walls, possessed a roof of this type, with a rich and beautifully-carved wooden ceiling below, evidently an addition at a later period than the erection of the outer roof, itself of much earlier workmanship than the time of Queen Mary. The approach to the rood-screens in some of the small churches was from outside the church altogether. At Llanegryn, near Towyn, this was the case, and access to the loft over its magnificent screen is still obtained in the same way, though a later piece of work now encloses the entrance.

The vote of thanks was then put, and carried by acclamation.

Mr. Baker, in replying, said that he did not wish specialism to be confined to one or two, but that the subject of church restoration should be taken up by the architectural bodies, which might confer their diplomas on students who had distinguished themselves in that course of study. If that were done the clergy would then know where to apply. Under the Commonwealth there was undoubtedly great destruction, and it was well known that the old plate was destroyed, as new plate had to be afterwards supplied. He could not, however, agree with the Chairman that there was so much damage done in the time of Henry VIII., when art was more respected than during the Commonwealth. The Jacobean work in Wales was, he believed, long behind the time when it was used in England. He had been asked whether the "three-decker" should be left or not. His idea was that matters of church arrangement should be left in a great measure to the clergy who were responsible for the ritual; but, on the other hand, he sometimes found it necessary to use his influence to prevent the clergy from being hampered by ideas of ecclesiological correctness, for instance, in preventing a pulpit being put on the north, which was supposed to be the correct side, when half the congregation could not see or hear the preacher. It was, therefore, the right of the clergyman to say how he would like his church arranged, and it was the province of the architect to carry out his wishes in such a way as not to destroy the historical interest of the building. Thus, while the clergyman had the right to make the history of the nineteenth century, the architect had the right to preserve the past history to the utmost of his power. Because the architect might be imbued with a taste for Gothic, there was no reason now-a-days that he should be voracious. Sir Gilbert Scott deplored many of the things he did at first, and the older he became the more conservative he got, so that, with more knowledge, he respected work he did not respect in his earlier days. A church restorer should therefore respect all the work he saw in a church; he should not ruthlessly destroy anything because he considered it ugly; and should not alter anything unless there was an absolute necessity for so doing. Every diocese should have a museum where all the old relics found in churches which could not be used should be deposited. Then if every architect, when he restored a church, would only write an account of the edifice, it might be inserted in the archæological journals, or, better still, if the Institute or the Association took up the matter a sort of record might be established. A question had also been asked about the rood-screens, and he might reply that in the church at Derwen, for instance, where the rood-screen took up two-thirds of the space, there was a stone staircase slightly projecting in the thickness of the wall. Some of the churches he had referred to possessed a separate chancel. With regard to the use of chestnut, he had found many practical carpenters who had difficulty in detecting it. When new it was easy to detect the difference between chestnut and oak, but that was not the case when the timber was of great age.

LECTURES AT CARPENTERS' HALL.

ENGLISH CARPENTERS AND FOREIGN COMPETITION.

THIS was the subject of the first of this year's course of free lectures to artisans and others connected with the building trades, and it was treated very fully by Mr. Banister Fletcher, who had a large audience, on the 2nd inst.

The lecturer quoted at some length from recent Blue Books on the Depression of Trade, and then read the following pithy and pertinent remarks, which really sum up the whole subject, by Mr. F. Dashwood, Secretary of the Clerks of Works' Association:—

"The importation of foreign joinery, which has been steadily increasing for some years past, must seriously affect the home producers. Take one single article,—doors. For each door imported,—and there are thousands sent into this country every year,—it means the loss of one day's work to an Englishman. I more particularly mention doors, as that was the earliest branch of joinery imported which was extensively used. This extensive use of foreign joinery is little known outside the trade. The purchasers and tenants of houses are rarely able to distinguish the difference between English and foreign, and care but little whether it is the one or the other. The question arises, which is the better of the two? There is, I think, no question as to which is the cheaper, as the great sale of the foreign article to those acute judges of cost,—the speculating builders,—quite disposes of that. Some in the trade might be inclined to think that the 'jerry' builder with his piecework contractor, having boys and young men,—called improvers,—working at a low rate of wages, could do it at least as

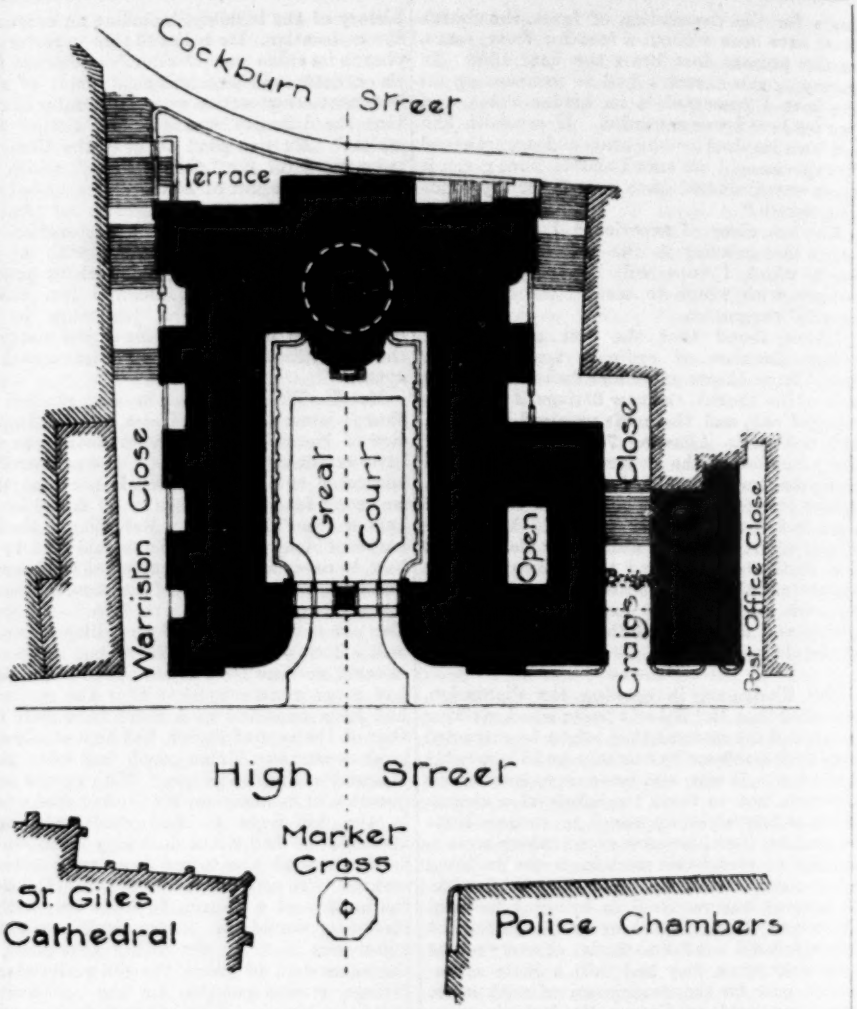
cheap as it could be done abroad, and then have to add to the cost of manufacture the ship freightage, the delivery from the docks to the warehouseman or agent, the agent's profit, and then the cartage to the suburban 'villa.' But it is not so, and why? The fault lies in the bad system at present in teaching the young workmen their trade, and the bad supervision,—or *no* supervision,—as to the quality of the work done. The foreign workman is under a proper system of subervision, is taught to do good work rapidly and to carefully study the working in of the materials with the least waste. There is no loss in capital through keeping the timber for any length of time after it is felled, for in a very short time it is passed through a quick process of artificial drying, and then into the workshop, where the drying process is still kept up, the men working in a very high temperature. The waste on material is comparatively *nil*, as can be proved by inspecting the panels of the doors, which are often in three and four pieces in their width, carefully glued together. This is so well done that one seldom sees a broken joint, and my reply as to which is the better is, I am sorry to say, the foreign,—that is, in comparison with the article which would be turned out by the mechanics (so called) in the employ of the speculating builder from the wood green from the timber-stack, prepared in a shed adjacent to the 'villa,' with no means of drying either before or after being framed together. I will now state the case of a better-class of joinery (hardwood). Sixteen years ago tenders were invited for fitting up with oak a town-hall in the North of England. Eight or ten firms sent in prices. The highest was that of an English contractor, 11,000*l*.; the lowest that of a Swiss firm, 6,500*l*. The details were full of work of a most elaborate character, carving profusely introduced, the doors, and framing richly moulded, with linen-fold panels, &c. The Englishmen thought it could not be done at such a low price, with all the expense of freightage, &c., the work being prepared on the banks of the Lake of Geneva. It was in due course delivered and fixed. The wood was of excellent quality, dried and prepared in the manner above described, and the workmanship gave every satisfaction, It was turned out with a good finish, but to a practical joiner there was room for fault-finding in the method of framing. This, however, was the only fault. Some three years after it was as good as when first fixed,—this being a sufficient test of its quality. Again, to take another example from the present time. A German firm prepare parquetry for flooring at Altona, near Hamburg, and can successfully compete with English contractors, having recently laid floors at several buildings in the City, viz., the Baltic Sale Rooms, the Scottish Imperial Insurance Company, the Union Bank of Australia, &c. The oak is generally German grown, but sometimes brought from Russia and Austria. The work is very simple. The floors are laid on open-jointed deal floors, the oak being about 2 ft. 6 in. long, 4 in. wide, and 1 in. thick. These pieces are laid in 'herring-bone' courses, grooved and cross-tongued all round, and secret-nailed. The battens are prepared at Latoria, being first thoroughly dried and worked to exact sizes; they are then packed in bundles and sent by ship to London and laid by Swiss and German workmen. These men are very frugal and temperate in their habits. They work much longer hours than the Englishman, working with a will, and take a great pride and interest in all they do. The oak and herring-bone parquetry floor is laid complete and twice waxed for 1s. 4d. per foot super. Why should not our English joiners do this work? The reasons are not far to seek. 1. There is no superfluous timber to pay carriage for, and no waste, the timber being prepared in most cases very near the spot on which it grew. 2. The workmen live simpler lives, and can therefore afford to work for less wages. Young English mechanics,—more particularly in London,—too much abuse their spare time. They have too little self-culture. If young mechanics would only take to their trades with a will and an interest, spending their spare time in technical schools, avoiding enervating and useless pleasures, the foreigner would soon find his way back to the Continent."

The lecturer then proceeded to quote from the Final Report of the Royal Commission on the Depression of Trade, and he said that in order to enable English workmen to maintain their own it was necessary to strongly insist on greater technical study and application on their part. With regard to employers and manufacturers, he would say that what leeway they had made by some of them having sent abroad inferior articles, whereby the great *prestige* of the English manufacturer's name had been injured, must be made good by combined and continued efforts of all trades to raise and maintain the standard of British goods to its old goodness, remembering that the old adage "Honesty is the best policy" was as true to-day as when first spoken, and that the Biblical injunction, "Be honest and just in all your dealings," was meant to apply to every-day life.

The second of the present series of lectures was given on Wednesday evening last at Carpenters' Hall, London-wall. The lecturer on this occasion was Professor A. B. W. Kennedy, M.Inst.C.E., who chose as his subject "Girders and Beams," and was listened to by the largest audience that has attended any of these lectures. A report of the lecture will appear in our next.

Fairfax House, Putney.—We have received from the sub-committee appointed to take steps for the preservation of Fairfax House a statement which shows that their want of success is not due to any lack of effort on their part, but is solely owing to the owner insisting upon a higher sum for the purchase-money than that at which it was originally understood he would sell it for. In a few days the house will have disappeared. We gave a view of it and some details of the staircase in the *Builder* for Feb. 12 last.

The "Victoria Terminus," Bombay.—The Great Indian Peninsular Railway Terminal Buildings, Bombay, erected from the designs and under the supervision of Mr. F. W. Stevens, F.R.I.B.A., A.M.I.C.E., has been named the "Victoria Terminus," in commemoration of H.M. the Queen's Jubilee, held in India on the 16th of February. These extensive buildings were illustrated in the *Builder* a few months ago.



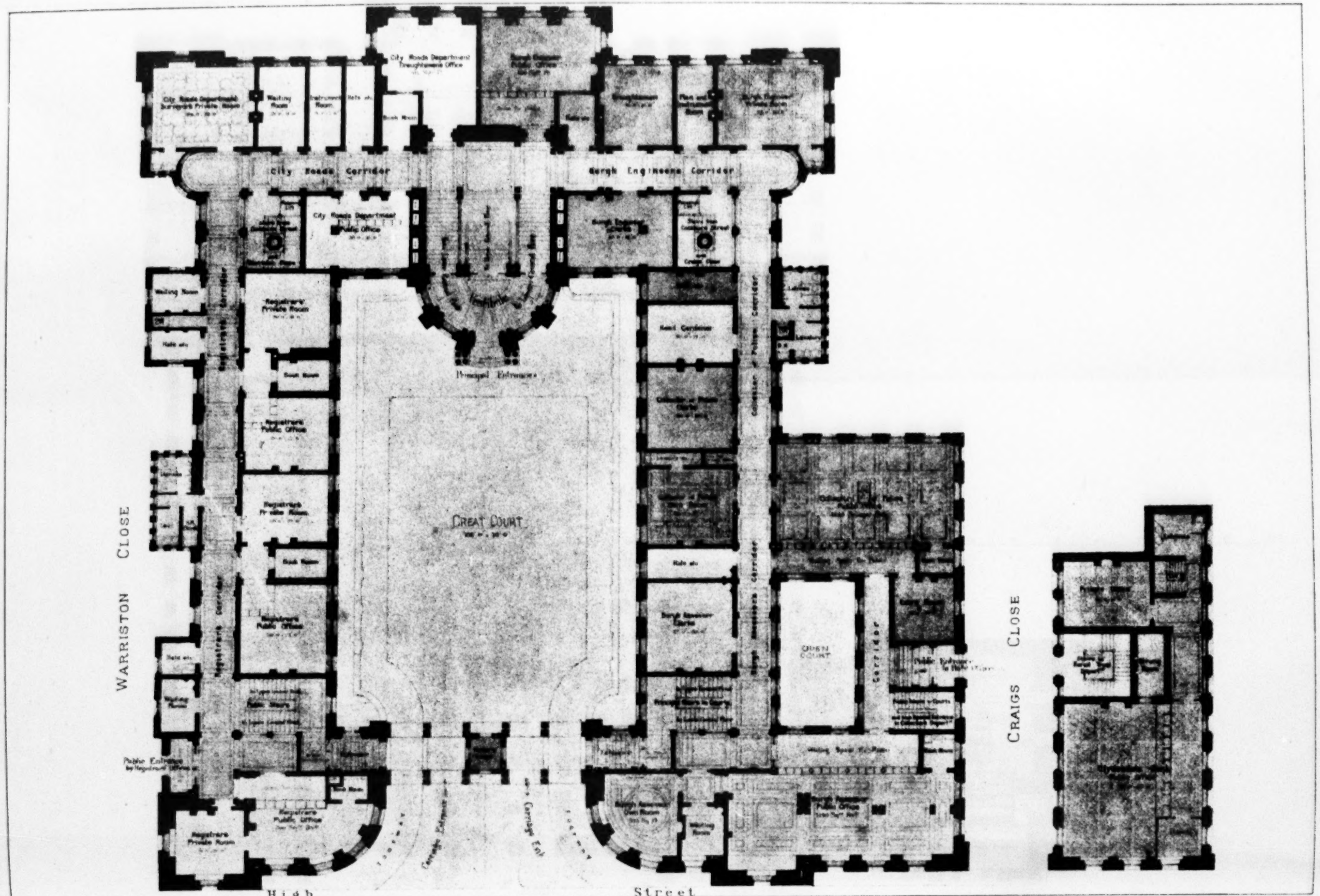
The Edinburgh Municipal Buildings.—Block Plan of First Premiated Design.

Illustrations.

THE PROPOSED MUNICIPAL BUILDINGS AT EDINBURGH.

THE whole of our illustrations this week are devoted to the premiated designs submitted in the Edinburgh Municipal Buildings competition. Of the design which took the first premium, that by Messrs. Leeming & Leeming, we give the elevation to the High-street, and the elevation to Cockburn-street, as well as plans of the lower ground floor and upper ground floor. Of the second premiated design, submitted by Mr. Malcolm Stark, of Glasgow, we give the elevation to Cockburn-street and the plan at the High-street level; while of the design to which the third premium was awarded, that, namely, by Messrs. J. W. Simpson & E. J. Milner Allen, we also give the elevation to Cockburn-street and the plan at the level of High-street. For further particulars regarding the designs we refer our readers to Mr. Waterhouse's report, which was recently published in our columns (see p. 330, *ante*) and to our own recent notices of them (see pp. 311, 341). We hope to further illustrate these designs, as well as some of the others, in future numbers.

The Late Mr. M. E. Hadfield.—A memorial has been placed in St. Marie's (R.C.) Church, Sheffield, in the north transept, in memory of the late Mr. M. E. Hadfield, architect. It is executed in choice white alabaster, and consists of a canopied niche with the Pieta in high relief, and below, a marble slab, with inscription in raised letters. It has been designed in the style of the fourteenth century, the church itself having been planned by the late Mr. Hadfield and his partner, Mr. Weightman, after careful study of that of Heckington, in Lincolnshire, which they drew and measured early in the Revival, about 1846. Mr. Frank Tory, sculptor, a student of the Lambeth School of Art, now of Sheffield, who has twice gained the National Silver Medal for modelling from the antique, has executed the work, and Mr. C. Hadfield was the architect.



EDINBURGH MUNICIPAL BUILDINGS, FIRST PREMIATED DESIGN.—MESSRS. LEEMING AND LEEMING, ARCHITECTS.

PLAN OF LOWER GROUND FLOOR.

EDINBURGH MUNICIPAL BUILDINGS, FIRST PREMIATED DESIGN.—MESSRS. LEEMING AND LEEMING, ARCHITECTS.

PLAN OF LOWER GROUND FLOOR.

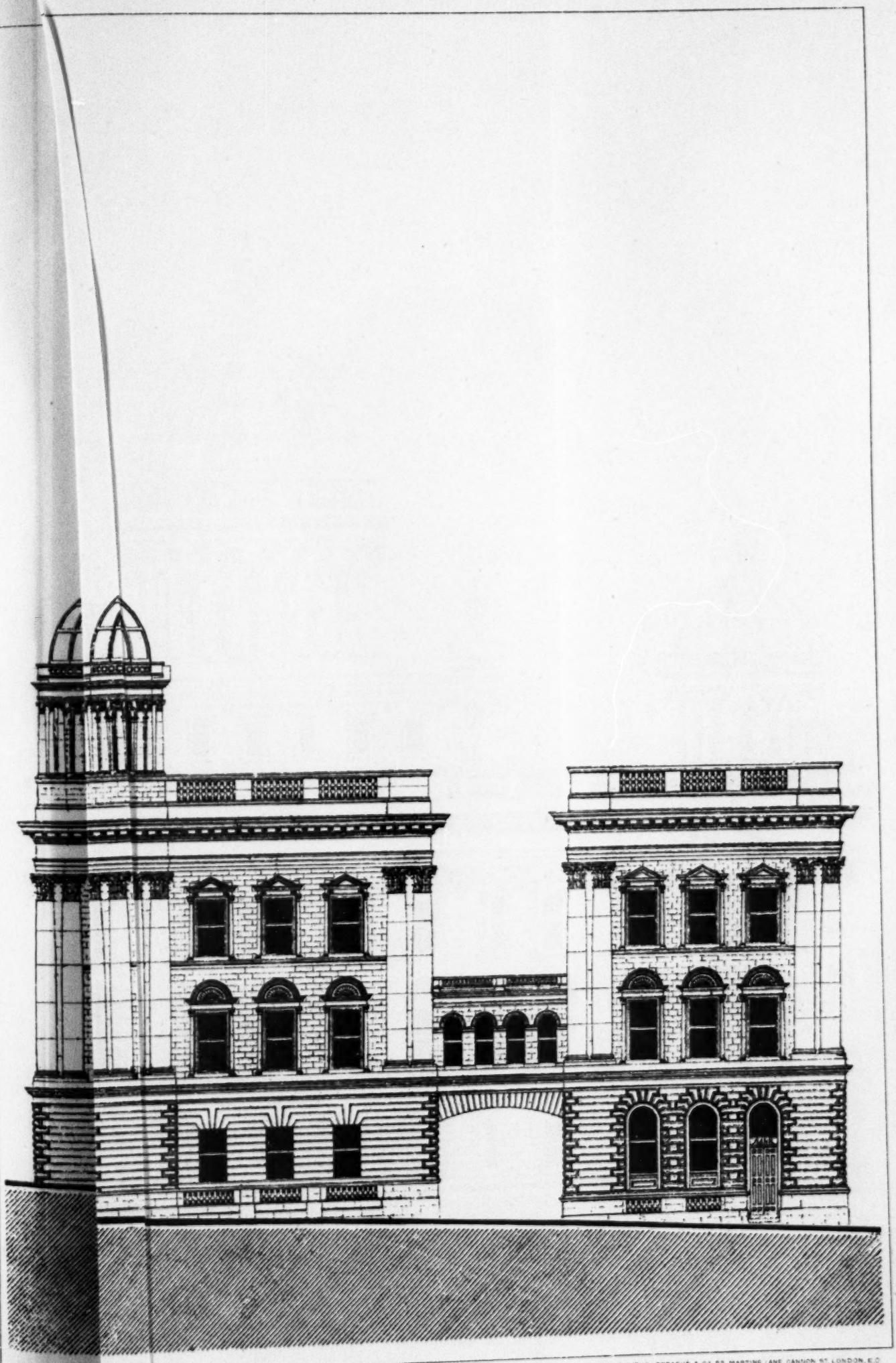
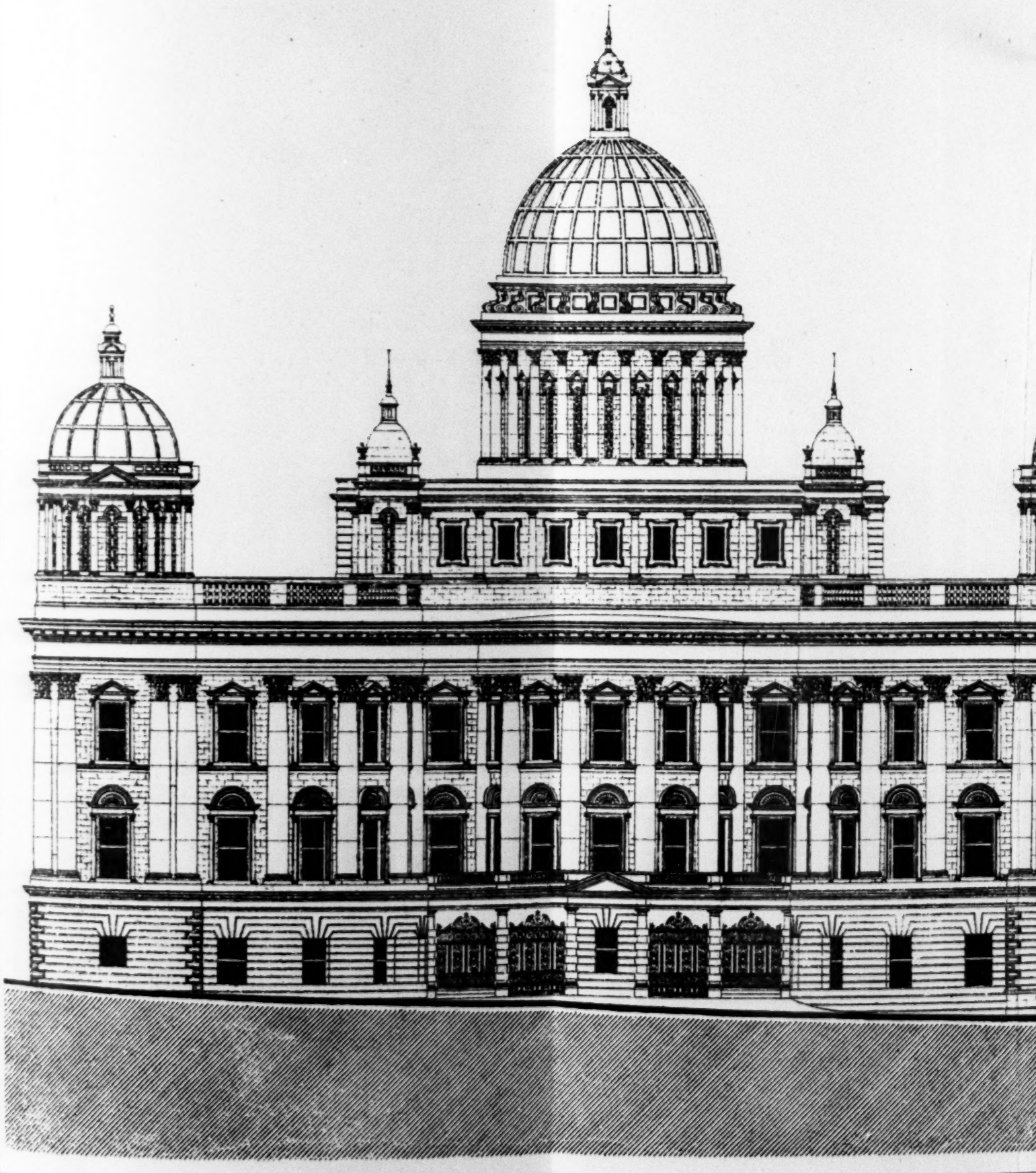


PHOTO-LITHO., SPRAGUE & Co. 22, MARTINS LANE, CANNON ST., LONDON, E.C.

IGN.—MNG AND LEEMING, ARCHITECTS.

TREET.



EDINBURGH MUNICIPAL BUILDINGS, FIRST PREMIATED DESIGN.—MESSRS. LEEMING AND LEEMING, ARCHITECTS.

PLAN OF LOWER GROUND FLOOR.

EDINBURGH MUNICIPAL BUILDINGS, FIRST PREMIATED DESIGN

ELEVATION TO THE HIGH STR

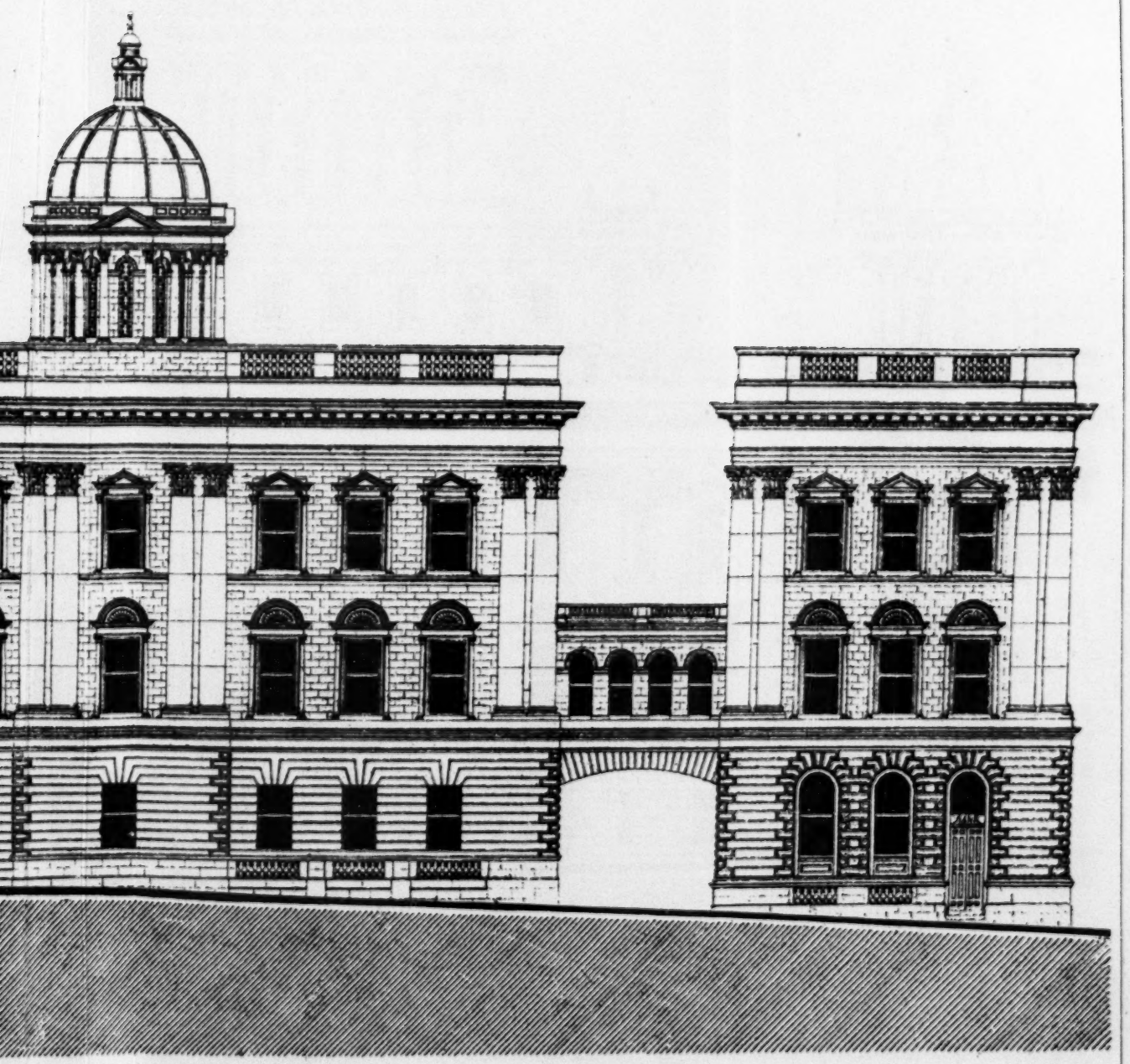


PHOTO-LITHO., SPRAGUE & Co. 82, MARTINS LANE, CANNON ST, LONDON, E.C.

ESIGN.—Messrs. Leeming and Leeming, Architects.

H STREET.

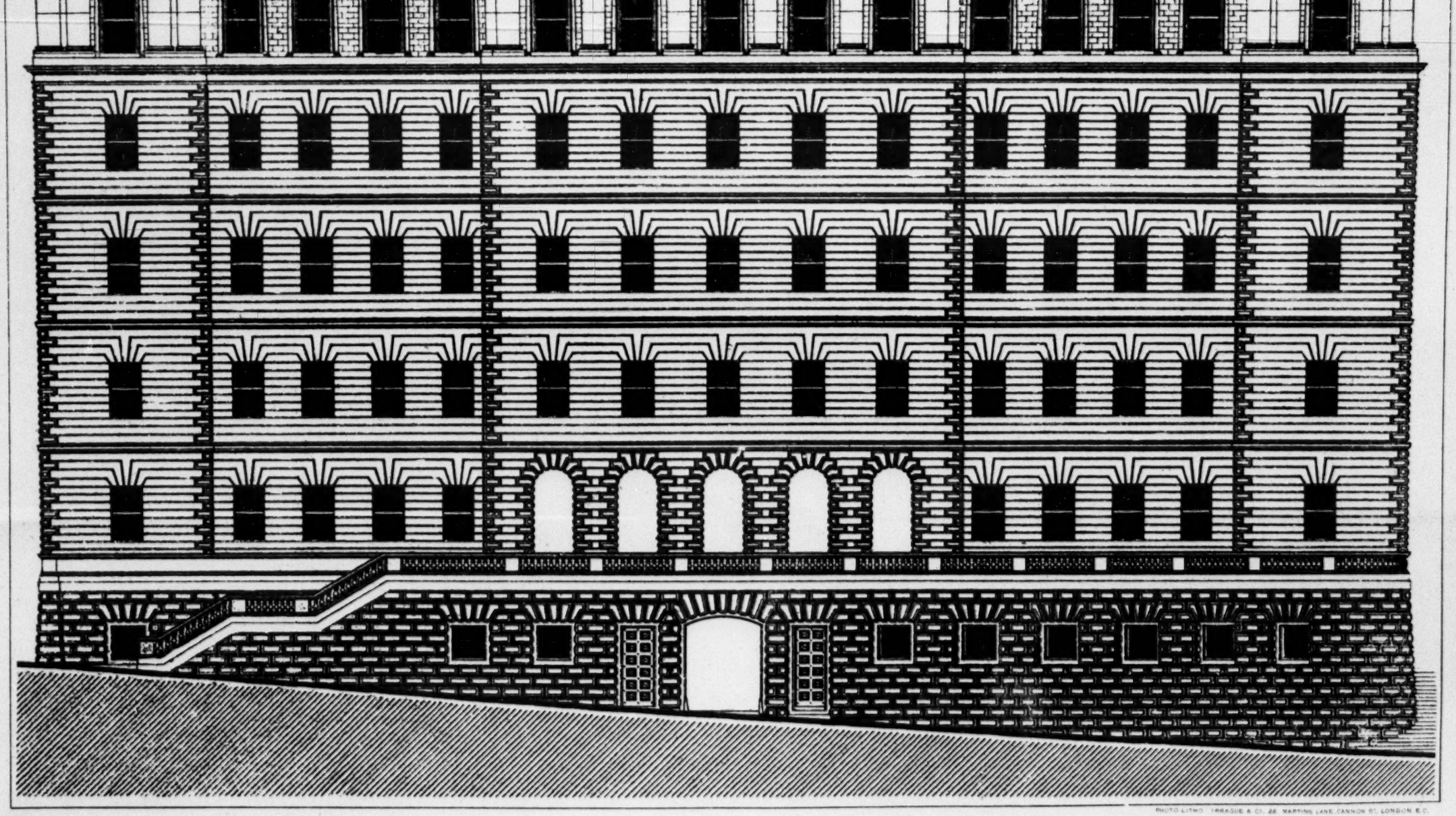


PHOTO-LITHO TERRAGUE & CO. 28 MARTINS LANE CANNON ST. LONDON E.C.

EDINBURGH MUNICIPAL BUILDINGS, FIRST PREMIATED DESIGN.—Messrs. Leeming and Leeming, Architects.

ELEVATION TO COCKBURN STREET.

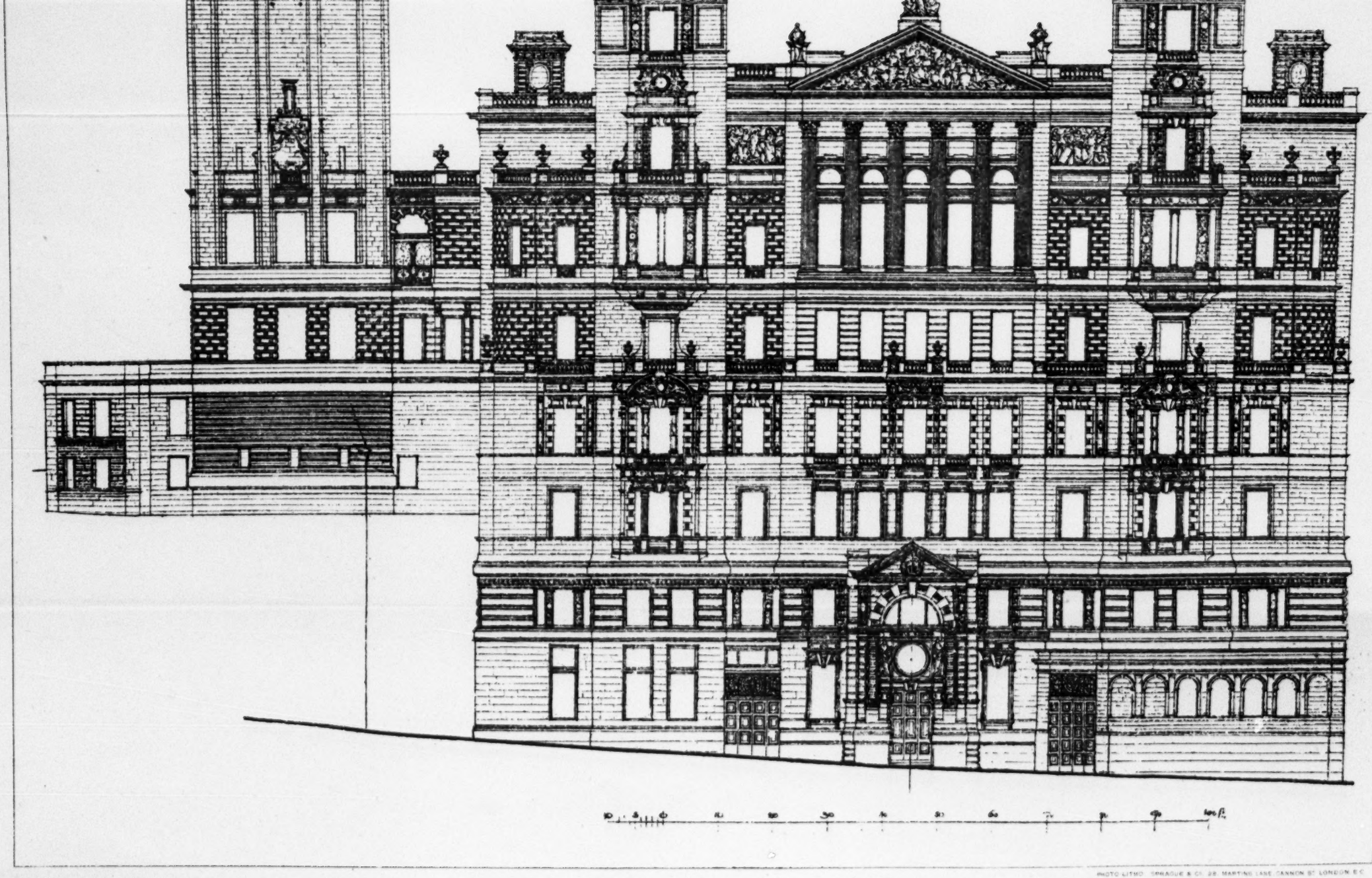
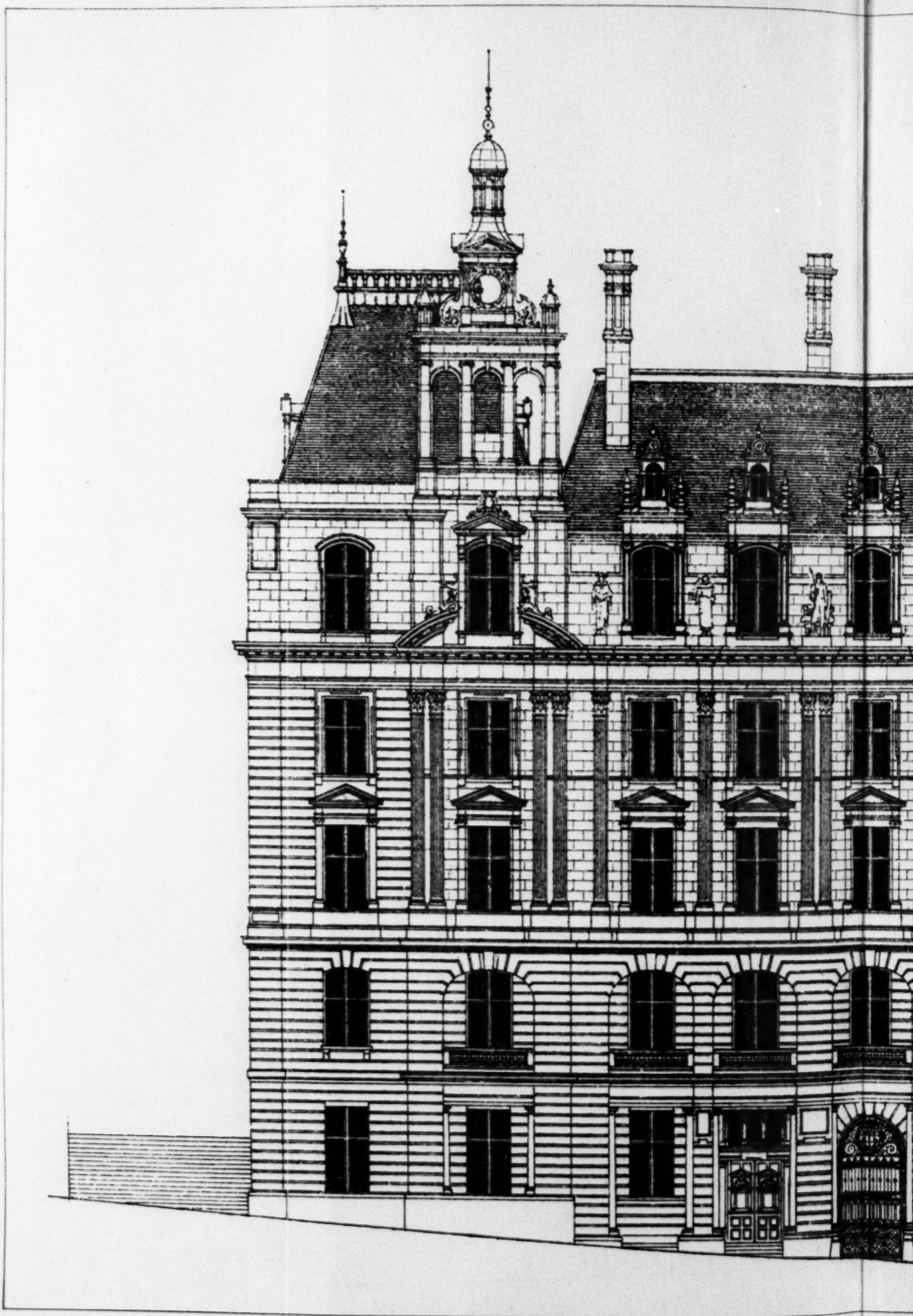


PHOTO-LITHO: SPRAGUE & CO. 28, MARTIN LANE, CANNON ST. LONDON, E.C.

EDINBURGH MUNICIPAL BUILDINGS, SECOND PREMIATED DESIGN.—Mr. Malcolm Stark, Architect.

ELEVATION TO COCKBURN STREET.



EDINBURGH MUNICIPAL BUILDINGS, THIRD PREMIATED DESIG

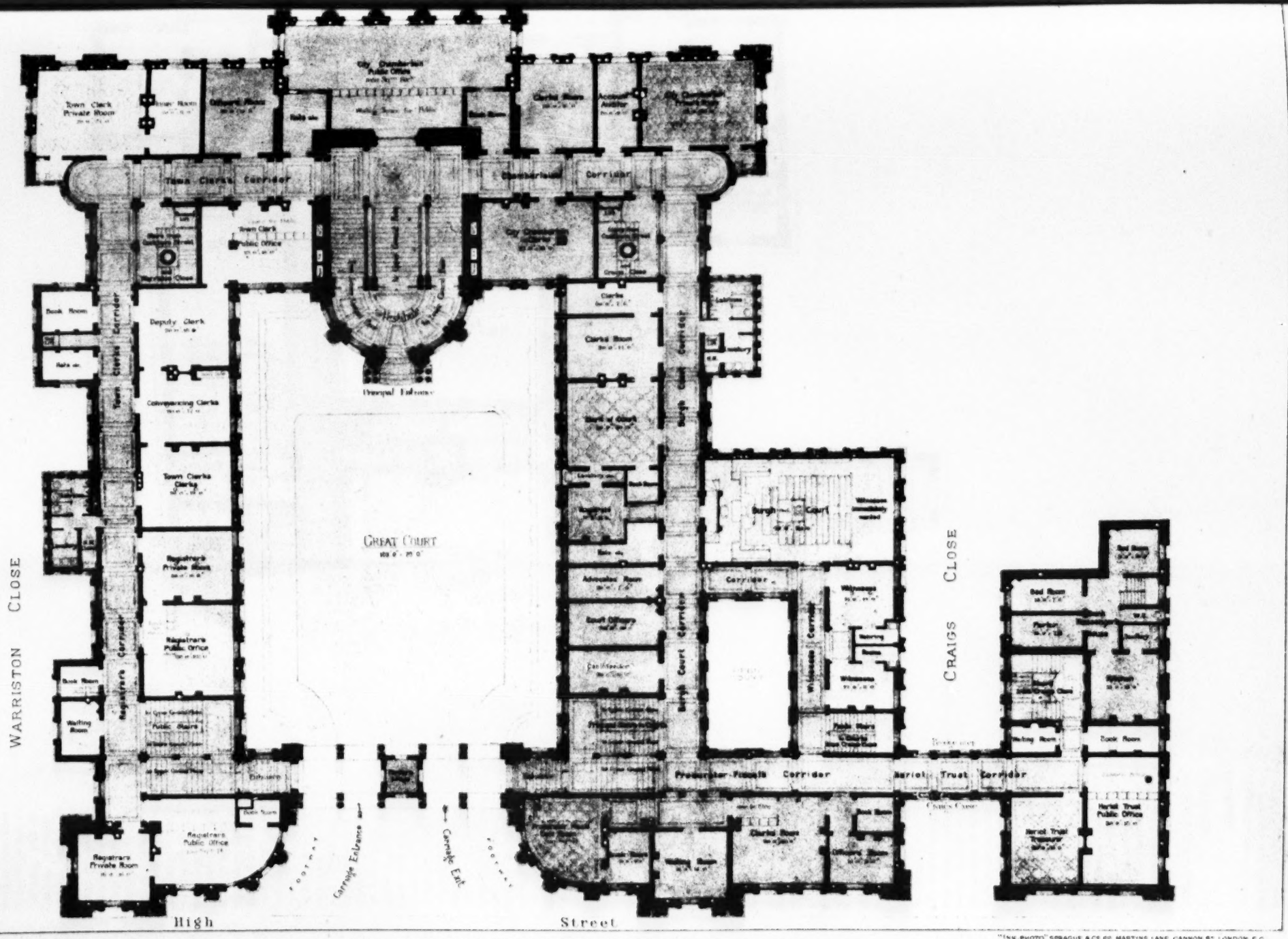
ELEVATION TO COCK

PHOTO-LITHO. SPRAGUE & CO. 48, MARTINS LANE, CANNON ST. LONDON, E.C.

PLAN OF UPPER GROUND FLOOR.

DESIGN.—Messrs J. W. Simpson and E. J. Milner Allen, Architects.

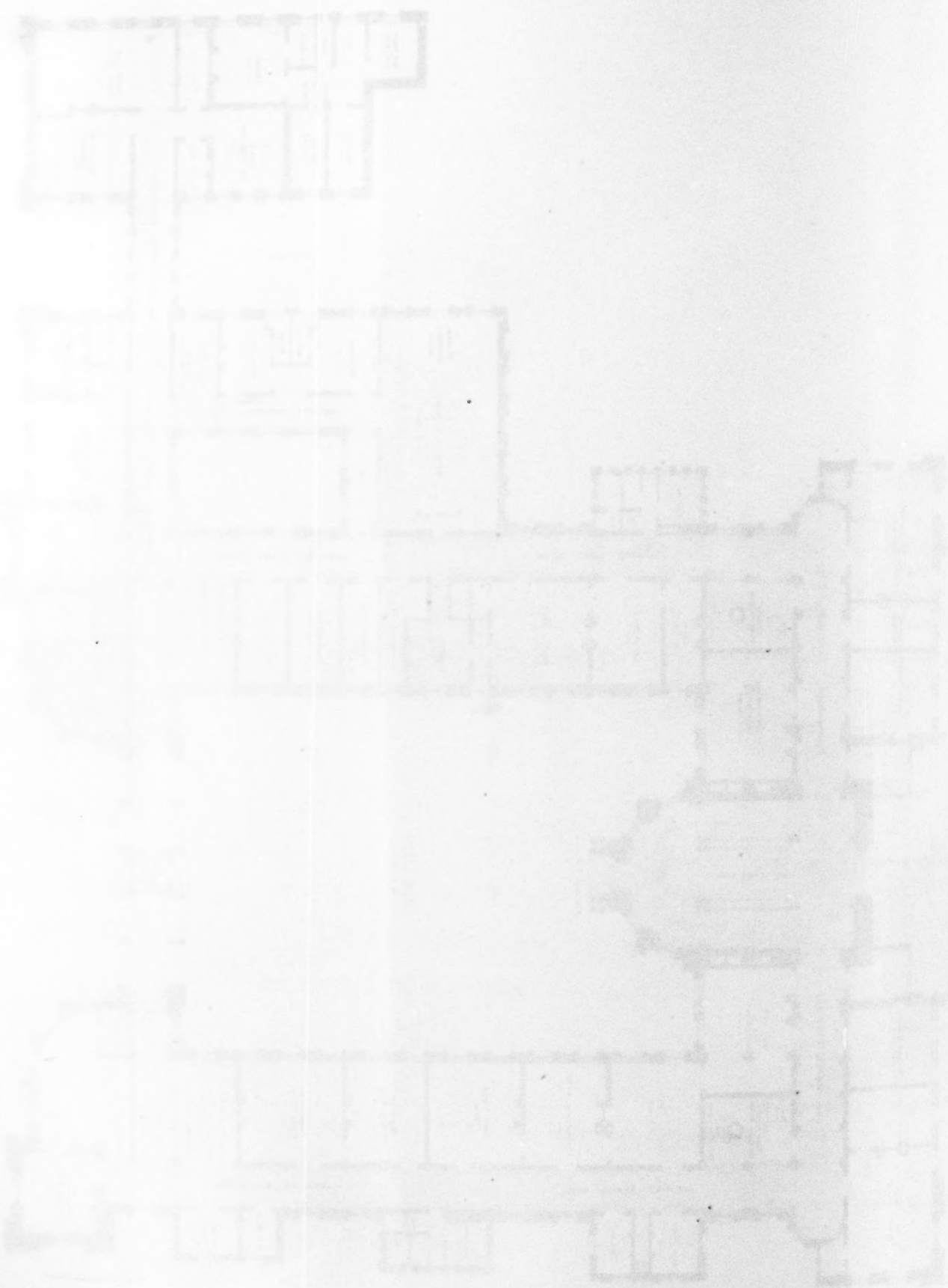
COCKBURN STREET.

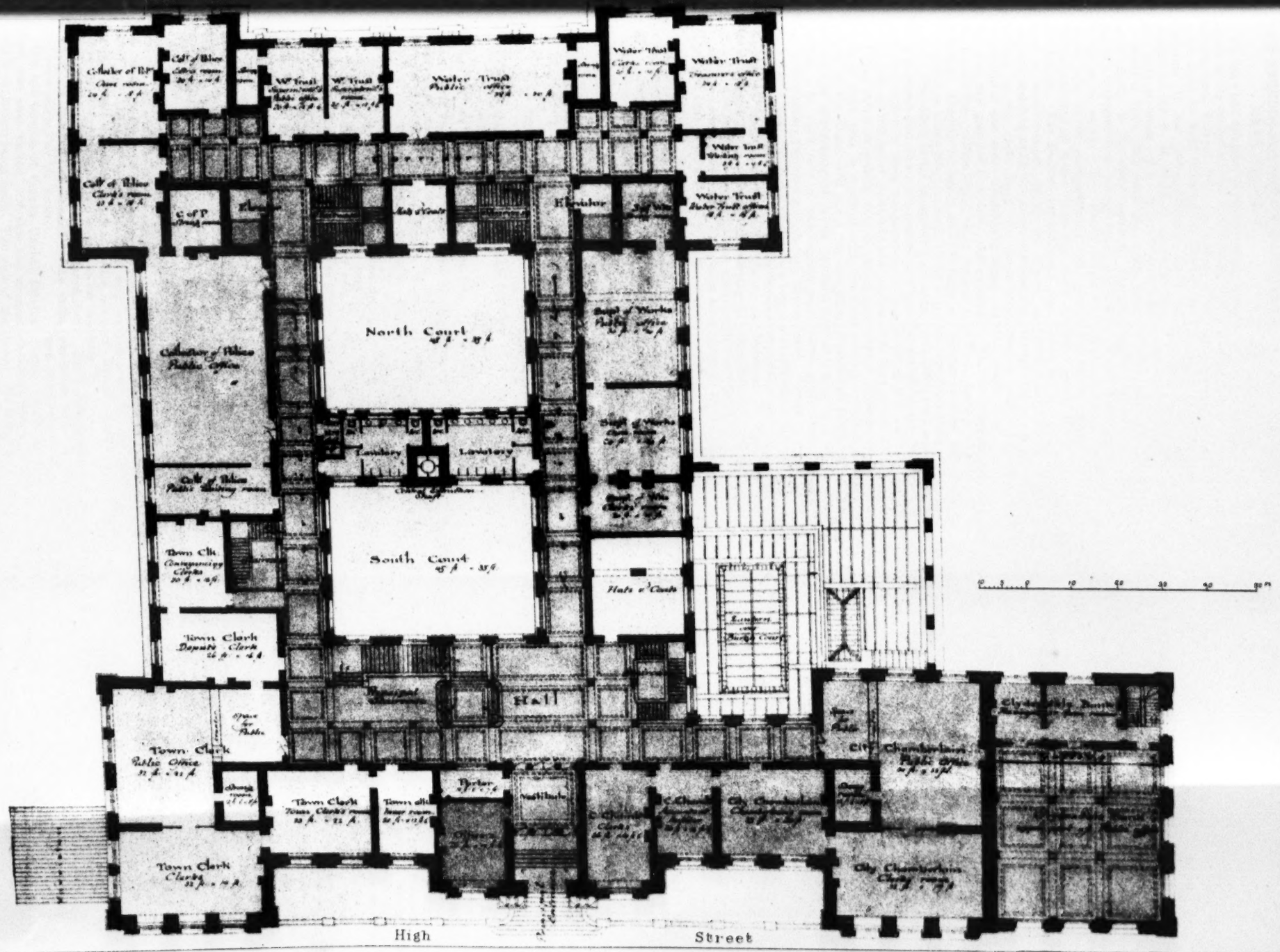


"INK PHOTO" SPRAGUE & Co. 62, MARTINS LANE, CANNON ST., LONDON, E.C.

EDINBURGH MUNICIPAL BUILDINGS, FIRST PREMIATED DESIGN.—MESSRS. LEEMING AND LEEMING, ARCHITECTS.

PLAN OF UPPER GROUND FLOOR.




North Court
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Public Office
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Treasurer's Office
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Water Trust

NEW REREDOS FOR LANGPORT CHURCH, NEAR TAUNTON.

WE have had an opportunity of seeing, at the studio of its sculptor, Mr. G. W. Seale, Coldharbour-lane, Brixton, the new reredos which is about to be fixed in Langport Church, near Taunton. It has been executed from the designs of Mr. J. D. Sedding, architect, and is a very pleasing work. Upon a plain base of selected Ham Hill stone rest eight semi-triplè shafts of the same material, supporting rich Perpendicular canopy work, executed in the same stone. The shafts divide the space into seven compartments, of which the central one is larger than any three of the others. The central compartment contains a well-arranged group of Christ in majesty, standing amid the seven candlesticks, holding in His right hand the seven stars symbolical of the seven churches of Asia. At His feet, and grouped in a circle, are kneeling the twenty-four elders, laying their crowns at His feet. The central figure and the three or four elders on either side stand out boldly in the round. The elders in the background are admirably grouped, and there is a marked individuality and variety in their countenances. This group, like all the other figures in the reredos, is of Caen stone, singularly fine in quality and white in tone, and in contrast with the rich colour of the Ham Hill stone the sculpture has all the appearance of being executed in marble. At each side of this central panel is a narrow niche, containing each two figures superposed; next comes, on each side, a larger niche, the one on the right-hand of the Saviour containing a figure of St. Peter, and the one on the left-hand a figure of St. Michael slaying the dragon. The reredos is terminated at each end by another narrow niche, each containing two figures, so that there are four of these narrow niches, containing eight figures. The four upper figures in these narrow niches are the representations of the four Evangelists; the figures below them are Bishop Ken, St. Paul, St. Andrew, and Bishop Beckington, the lower figures at each side thus being those of two bishops who were connected with the diocese. Altogether, the work is one which reflects great credit upon architect and sculptor. We hope shortly to give an illustration of it.

ROMAN CATHOLIC CHURCHES IN SOUTH LONDON.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

THE third Saturday afternoon visit of the Architectural Association was made on Saturday, the 5th inst., to the Roman Catholic Church of St. Mary, Clapham Common. The church was built from the designs of Mr. Wardell, some thirty years ago, and a new chapel (the object of the visit) has lately been built and decorated by Mr. Bentley, who met the party and described the building. The chapel is dedicated to the Madonna. The altar, raised above the floor, has a base and table of marble, the front being of woodwork in panels, containing painted subjects from the life of the Saviour. Above, the reredos is of richly-panelled woodwork, containing a triptych enclosing a copy of an ancient Byzantine painting, now in Rome, of the Madonna and Child, known as the "Madonna of Terror." Excepting where the paintings are inserted in the panels, the whole is covered with rich gilding burnished. The ceiling and walls are treated in white and blue, in various designs; the ceiling, in panels, follows a Litany throughout, each panel symbolising a line. The three windows contain figures delicately traced on almost clear glass, the designs for which, as well as for the whole of the decorations, were prepared, full size, by Mr. Bentley, transferred to the walls, and hand-painted by Mr. Paice.

The new Church of Corpus Christi, Brixton Rise, was next visited. Of this the chancel only is at present being built. The plan of the complete building will consist of nave, about 75 ft. long; outer aisles, 16 ft. wide; chancel, with chapel and sacristies. The chancel is 32 ft. wide, covered with a barrel-vaulted roof, with ribs of wood, and the interspaces filled with fibrous plaster. The exterior is built with red bricks and Bath stone; the interior is plastered for decoration. Mr. S. J. Bentley, the architect, conducted the members over the building.

FRONTAGE LINES:

THE SUPERINTENDING ARCHITECT'S POWERS.

AT the meeting of the Metropolitan Board of Works on the 5th inst., the Works Committee's report recommended that the Board do apply to Parliament to enact that the decisions of the Superintending Architect, in regard to the defining of lines of frontage be, if questioned, referred for final decision to the Appeal Committee of this Board.

Mr. G. Edwards moved the adoption of the report, as it had been felt for some length of time by the Board and the public that there was a peculiarity in the law that there should be no appeal against decisions of the Superintending Architect as to lines of frontage. He thought the power now reposed in the Superintending Architect in that respect was greater than ought to be.

Mr. Wm. Shepherd moved, as an amendment, "That, having regard to the satisfactory manner in which the provisions of Section 75 of the Metropolis Management Amendment Act, 1862, have worked in the past, it is undesirable for the Board to attempt any amendment of the law." From 1863 to 1886 there had been given a total of 337 decisions as to lines of frontage by the Board's then Superintending Architect, and in only 25 cases were proceedings taken against these decisions. That was to say, for a period of twenty-three years these proceedings had averaged about one a year. Unless persons interested were contumaciously inclined, there was very little opposition to the Superintending Architect's decisions. It was quite impossible to please everybody, and he (Mr. Shepherd) contended that members of the Board were not so competent to decide these questions as the Superintending Architect, who was practically acquainted with such matters.

Captain F. M. Wenborn asked the Chairman's ruling, whether or not the proposed amendment was not a direct negative to the motion, and therefore was not in order?

Mr. Chas. Mossop said that it was very clear that it was a direct negative.

The Chairman ruled that that was so.

Mr. J. Jones said the Superintending Architect had to be careful in giving the most just decision in his judgment, as he was responsible to the Board, who could displace him if not satisfied with his work. (Mr. Price: "Hear, hear.") The Superintending Architect was the breath of their (members of the Board) nostrils. (Great laughter.)

A Member observed that, in a conversation with Mr. Vulliamy, the late Superintending Architect, some time prior to his death, Mr. Vulliamy said that the power vested in him by Parliament was greater than any man ought to have. (Hear, hear.)

Mr. E. R. Cook said it would be no reflection on the newly-appointed Superintending Architect or any other gentleman to attempt to do away with the anomaly. He (Mr. Cook) contended that it did not require technical knowledge to decide on a line of frontage, but simply common sense. (Hear, hear.)

Mr. T. G. Fardell, while agreeing that there should be a court of appeal, did not agree that it should be to a committee of the Board. He moved that the words after the word "questioned" should be deleted, and the words "subject to appeal" inserted.

Mr. G. B. Richardson seconded, and said there was not the slightest chance of Parliament agreeing to the Works Committee's proposition. He only knew of two courses open,—one was an appeal to the Courts of Law, and the other to two Members of the Institute of British Architects. ("Oh" and "Hear, hear.")

Mr. S. Price said the question had arisen in connexion with the Brixton-rise case, and he was of opinion if an appeal was to be introduced,—which he saw no necessity for,—it should be from an expert to an expert. (Hear, hear.) He thought the newly-appointed Superintending Architect was thoroughly capable of coming to a proper and equitable decision on such questions. (Hear, hear.)

Mr. W. R. Selway agreed with Mr. Cook that an expert was not required to decide such cases, and that the Appeal Committee of the Board was a very fair tribunal to come to, having the advantage of counsel and experts to help them, if necessary, in arriving at a proper decision. (Hear, hear.)

The amendment was then put, when 12 voted for, and 25 against, and the original motion was then carried by 24 to 14.—*Metropolitan.*

RURAL SANITATION.

ASSOCIATION OF PUBLIC SANITARY INSPECTORS.

AT the meeting of the Association of Public Sanitary Inspectors, held on Saturday evening at the Westminster Town Hall for the first time, a paper was read by Mr. J. A. Davenport, C.E., of the Nantwich Sanitary Authority, on "Rural Sanitation." There was a very good attendance, and Mr. Jerram, the Chairman of the Council, presided. The lecturer said that the rural district with which he is connected is of great extent, having an area of more than 103,000 acres. This fact made it especially desirable in the majority of cases rather to convert into a temporary hospital by isolation any house in which an infectious disease might have broken out, than run the risk of spreading it by removal to a central hospital, which must necessarily be many miles distant from the extremities of the district. Fourteen years ago both smallpox and scarlet fever were prevalent, but the policy of isolating infected houses had succeeded so well that during nearly twelve years such cases had been very rare. The annual rate of mortality from the seven leading zymotic diseases had fallen from 2·16 per 1,000, at which it stood previously to the passing of the Public Health Act of 1872, to 0·59 per 1,000, at which it stood two years ago. The means by which this had been accomplished were described under the heads of water supply, sewerage, situation of offices, and new buildings. The lecturer said he agreed with Mr. Bateman, who in a recent paper had shown that where there was a pump-well there was almost sure to be some polluting element within the radius of its influence. In many cases the polluting influence had been greatly minimised in his district by the substitution of 30 in. glazed socket pipes, with cemented joints, for the usual brickwork round the well. With a well properly constructed on this plan, water could only percolate through at the bottom of the well. On Lord Tollemache's estate, and in one or two other townships, the landowner had generously erected large tanks built in brick and cement, raised above the ground level, roofed over, and ventilated. With the heavy rainfall of Cheshire (36 in. per annum), these tanks had proved of great service, where attention was paid to their regular cleansing, and where the water drawn from them was filtered before being used for drinking purposes. In one township (Church Coppenhall), which had no source of water supply except its pits, what seemed impending ruin had been changed into smiling prosperity, through an arrangement which the Authority had fortunately been able to make, to extend the mains connected with the London and North-Western Railway Company's well, sunk into the new Red Sandstone at Whitmore, in the neighbouring county, with those of Church Coppenhall. Nearly 400 houses had since been built. The former straggling township was fast assuming a semi-urban aspect, and the land had been greatly enhanced in value as it came into the market for building purposes. The system of mains had been extended year by year, until they now included fifty miles, supplying 1,700 houses, and having preparation for extension to the supply of many hundreds more. The moderate scale of charges (1d. in the pound), which was the same throughout, was not sufficient in scattered townships to cover the cost, but the landlords had agreed to pay the difference, which would be covered by a payment of from 6d. to 1s. per acre per annum for the period of twenty or thirty years which the loan obtained for the purpose might have to run. With regard to sewerage, they had not yet been able to put into operation any comprehensive scheme. They had got rid very generally of the sink-hole or *mergin*, as it was called, a fermenting, festering mass, found almost universally near the cottage doors, when the lecturer first entered the district. They had substituted for it a process of garden sub-irrigation which answered very well where the top drains were properly attended to. But this was too much trouble for the tenants, and he feared that in the majority of instances it was not working perfectly. The sewering of one village had been completed on what he regarded as the best known method, ventilated manholes with flushing arrangements being

placed at every point where there was a change of line or gradient. The sewage was received in tanks and applied to the land by contract with a farmer. In other parts, Bailey Denton's automatic tank, Field's flush tanks, and the spongy iron filter were in operation. The closets and ashpits were dealt with on the pail system, Manchester pattern, in 2,000 out of the 7,500 houses in the district. In the five most populous townships contractors emptied the pails every ten days, freely using carbolic acid, "Sanitas," and other disinfectants supplied by the sanitary authority. Closets with covered cesspools were scavenged quarterly. The lecturer considered the frequent removal of human excreta one of the most important factors in the problem of disease-prevention. He was in favour of the pail-closet, but would prefer a weekly removal. Closets and ashpits should be at a minimum distance of 20 ft. from the dwelling-house. New buildings were erected subject to sanitary by-laws, which at first caused much friction, but were now submitted to almost without a grumble. Up to the end of last year 1,070 new buildings had been passed, the influence for good of the regulations having proved very great. The extra expense involved at the outset was amply compensated to the owner by better work and better value, and to the tenant by increased comfort and health. He counselled his brother inspectors to agitate for the general adoption of building by-laws, so that old errors might for ever be done away with. Questions of overcrowding and of slaughter-houses were also dealt with, and the lecturer said he had taken great interest in the Canal Boats Act, his report on the subject having, he believed, been of much assistance to Mr. George Smith in procuring the passing of the Act. The good done by the efforts of sanitary reformers was well illustrated by comparing the 80 per 1,000 rate of mortality in London in 1685, and the 50 per 1,000 of 1785, with the 24 per 1,000 of 1885. With science still advancing, who would dare to say what the rate would be in 1985?

The paper was exceedingly well received, and the Chairman and the several succeeding speakers highly complimented Mr. Davenport on its quality, a cordial vote of thanks being accorded.

Previously to the reading of the paper, a statement said to have been made at a recent meeting of another society, reflecting upon the character for integrity of sanitary inspectors generally, was mentioned, as a question of privilege. The matter was left in the hands of the Council.

THE ROYAL JUBILEE EXHIBITION, MANCHESTER.

THIS Exhibition, which has already been alluded to in our columns, bids fair to be a great success. The primary object of its promoters is to illustrate the art-progress of the British nation during the Victorian era. The Council of the Exhibition very wisely entrusted the collection of examples for the Architectural Court to the Manchester Society of Architects, who have associated with themselves representatives of various architectural societies throughout the kingdom. In response to the advertisements which appeared in the professional papers, and through the action of the above-named societies, we are informed that a very fine collection of architectural drawings of buildings erected during the past fifty years is being got together, and will be hung in a prominent position in the Exhibition. Some attempt will be made at a chronological arrangement of the drawings, and to this end examples have been promised of works by the late Sir Charles Barry, Edward Barry, C. R. Cockerell, Sir M. D. Wyatt, Thos. H. Wyatt, H. Tattersall, G. E. Street, Ed. Walters, Sir R. and S. Smirke, Sir G. G. Scott, and others; while the examples by living architects will comprise contributions from the following gentlemen:—D. Brandon, J. P. Seddon, G. Truefitt, C. Hadfield, Paley and Austin, J. Brooks, A. E. Street, C. Douglas and Sellars, Hansom, Emerson, Champneys, Pugin, Collcutt, Chas. Barry, Sir Horace Jones, Alfd. Waterhouse, T. Worthington, Mills and Murgatroyd, E. Salomans, T. D. Barry and Son, G. Grayson, T. G. Jackson, C. F. Hayward, R. Edis, J. O. Scott, B. E. Ferrey, H. B. Sang, and very many others.

Messrs. Elliott, Edminson, and Olney, of Manchester, have received orders to proceed at once with the construction and erection of the whole of the steam and other extensive cooking appliances, also the fitting up of the several kitchens, larders, and other offices required for the dining and refreshment departments of the Exhibition.

OBITUARY.

Mr. M. Ogle Tarbotton, C.E.—We record with much regret the death of Mr. M. O. Tarbotton, which occurred late on Sunday evening last at his residence, The Park, Nottingham. It appears that for some time past the state of Mr. Tarbotton's health had occasioned considerable anxiety, his illness resulting (according to the *Nottingham Guardian*) from over brain work and nervous prostration. He had been an official of the Corporation nearly twenty-eight years, his appointment as Surveyor being made in 1859, the year in which the Corporation adopted the Local Government Act. Subsequently, as Chief Engineer, Mr. Tarbotton was charged with the responsibility of carrying out many important public works, notably the Industrial Exhibition held in Horse Fair Close (the site of the present University Buildings), and the new Trent Bridge which was constructed from his designs, and the works in connexion with which were carried out under his supervision. Upon the Corporation acquiring the undertakings of the Nottingham Gas Company and the Nottingham Water Company, Mr. Tarbotton relinquished the office of Borough Engineer, in which he was succeeded by Mr. Arthur Brown, and was appointed engineer to the Gas and Water Committees and consulting engineer to the Corporation. He was also engineer to the Sewage Farm Committee. Mr. Tarbotton was frequently called as a witness before Parliamentary Committees, and as a specialist in questions connected with gas, water, and sewage, his advice was much sought. He was a member of the Institution of Civil Engineers, a Fellow of the Geological Society, and a Fellow of the Royal Meteorological Society. It is only quite recently that he read a thoughtful paper at the Parkes Museum on "Engineering and Architecture in Relation to Sanitary Science," the substance of which we printed in the *Builder* for Feb. 12.

IMPORTANT CASE UNDER THE METROPOLITAN BUILDING ACT.

BOVILL *v.* GIBBS AND IMBER.

THIS case, which is of considerable importance to builders, came before Mr. Justice Denman and Mr. Justice Mathew, in the Queen's Bench Divisional Court, on the 23rd ult., by way of special case.

It appeared that on the 1st of February, 1886, Mr. Bovill, the District Surveyor of St. Pancras North, summoned Messrs. Gibbs & Imber, builders, at the Highgate Petty Sessions, for erecting a dwelling-house and shop with an insufficient open space in the rear thereof, as provided by the 14th section of the Metropolis Management and Building Acts Amendment Act, 1882 (45 Vict., cap. 14). On the 1st of April, 1885, the District Surveyor received notice from the builders that they were about to erect in High-street, Highgate, three shops, and they commenced to build one shop early in April, 1885. On the 1st of August, 1885, the District Surveyor gave the builders notice under the Metropolitan Building Act, 1855, that the open space in the rear of one of the proposed buildings was of insufficient area, and not in accordance with sec. 14 of 45 Vict., cap. 14. The builders, prior to the receipt of this notice, had erected and covered in the shop in question. On the hearing of the summons the builders contended that the district surveyor was out of time in taking proceedings, because the six months' limitation during which he should take proceedings ran from the month of April, 1885, when their notice was given and the building commenced. On behalf of the district surveyor it was contended that the offence was a continuing one, and that even if it were not continuous, the time did not commence to run until forty-eight hours after the 4th of August, the day when the builders received notice from him. The Magistrates, being of opinion that the builders were right in their view of the law, dismissed the summons for not being taken out in time, but consented to state a case for the opinion of the superior court, the question for the opinion of the court being whether the summons was taken out in time.

Mr. Tickell appeared for the appellant, and Mr. Lane for the respondents.

Mr. Justice Denman, in giving judgment, said that the offence was making default in complying with the District Surveyor's notice, and not the erection of the building. He therefore allowed the appeal, and remitted the case to the magistrates to convict.

QUARRY-WORKED STONE.

SIR,—I trust you will again grant me space in defence of quarry-worked stone.

First, in reply to "G. C. W." [p. 331]. From his remarks it is very evident he has never seen stone whilst being worked at the quarry,—hence he is altogether erroneous in stating the cause of the cheapness of quarry-worked stone "is not far to seek, to a practical man, as a quarry-owner uses fresh-quarried stuff, which is, of course, soft and unseasoned." Allow me to state that the real cause is, the first cost of the material at the quarries is much less than when delivered in London or elsewhere, and the quarry-owner escapes the payment of railway carriage on waste, which is generally a considerable item on rough blocks. He is also satisfied with the profit only upon his worked stone, instead of a profit on block, and a further profit on the worked stone,—although this second profit must be obtained by men working it in other places than the quarry.

Then with reference to his remarks as to "newly-quarried stone being used instead of well-seasoned stone," he is far from correct. In this place, the working of stone was commenced with the sole object of working up "stale" or seasoned stone, which was vastly accumulating on account of buyers in London and country, as a whole, refusing *in toto* to purchase anything but the softest and most newly-quarried stone, and it always has been that the vendors of the softest stone (never mind its fitness or otherwise) always had, and have, the greatest demand for their stone.

The curse of the stone trade has been through people away from the quarries using the wrong stone,—choosing that which works the easiest, regardless of its durability, and hence it is we find Beer stone being used for Portland, Dumfries stone for Mansfield stone, and the like, all on account of their being in each instance the softer, and consequently the less durable stone, being much more cheaply worked.

Now if architects and builders only had their stone worked at the quarries, they would insure, at least, having the stone which was specified, and I hesitate not to say the stone used would be that most thoroughly seasoned.

Then, also, another benefit is reaped from the fact that, by doing away with the profit on the raw material and the profits of intermediate men, the right stone (not Beer or Dumfries palmed off, as I declared is done) would be obtained as cheaply as the baser or less suitable stone.

Secondly, in reply to "G. R. J." [p. 331], I think the foregoing facts enough to convince any architect of the utmost necessity of having stone worked at the quarries. And, seeing that such is continually and considerably on the increase, I think we may rightly conclude they are alive to the tricks that have been played them, and that in future we may reckon upon seeing the major portion of the stone worked at the quarries, and our stone buildings in future being better constructed, and much more durable, than those of latter-year construction have been since the introduction of these unworthy practices.

A QUARRY OWNER.

Portland.

SIR,—In the correspondence on "Masons' Wages," I notice "G. C. W." [p. 331, *ante*] says,—"A quarry-owner uses fresh-quarried stuff, which is, of course, soft and unseasoned. It is obvious that, be it limestone, gritstone, or freestone [*sic*], it should be well seasoned before being wrought; if it is not so, it cannot be expected to resist the London atmosphere." Allow me to enter my most emphatic protest against the assertion that stone should be seasoned before it be wrought. I have for years past been trying my utmost to dispose of this false but too prevalent opinion. Our old master builders almost invariably took their stone from the quarry nearest to their building, and worked it as soon as quarried, and the result is that it has stood well. For instance, Ancaster stone, not to mention a host of others, is said to stand well in its own locality, but to be unfit for the London atmosphere. Now, the reason it has stood well in the churches and other buildings in its own neighbourhood is simply because it *was* worked when it was soft and unseasoned. If any one doubt this, let him go to some old church, say of the thirteenth century, where he finds the stone thoroughly "well seasoned," and as sharp as when it left the masons' hand, and let him re-work the face of it, and I care not whether it be in the country or in London, he will assuredly find that in two or three years it will utterly decay. If he prefer a more modern example, let him send for a block of "summer-dried stone," such as we see advertised, and, if he get it, he will find the outer face very hard and non-absorbent, but the interior, when cut, will be found much softer, and will *never* become so hard as the outside. This is a simple fact well known to every mason. The lesson to be learned is equally simple. If you want to use stone properly, work it as soon after being quarried as possible. Season it *after*, not before, it is wrought; and stone which stands well in its own locality will stand practically equally well in the London atmosphere. Nature has provided a protection, but if we choose to deprive stone of this, she will not repeat the process, and we must suffer for our ignorance.

In three churches I am building in London, the stone has been worked at the quarries by Messrs. Randell & Saunders, of Corsham, and by Mr. Robert Lindley, of Mansfield and Ancaster, and both have admirably carried out the work entrusted to them. The slight defects occasionally caused in transit they have ever been ready to remedy, and I may say the same with regard to Continental firms who are supplying me with marble. Well-seasoned stone may be a treasure to the jerry-builder "running up" houses in mid-winter, but should be carefully avoided by every architect who values his reputation. Stone should be cleaned down as the work proceeds, if at all, and never scraped after long exposure to the air.

HUGH ROUMIEU GOUGH.

Regent-street, Feb. 28.

WASTE WATER FOR FLUSHING WATER CLOSETS.

SIR,—My letter on the above subject, which appeared in your issue of the 26th ult. [p. 332, *ante*], appears to have interested your readers to some considerable extent, as I have received communications from Leeds, Stratford, London, Brighouse, Brighton, Dartford (Kent), Slough, and Ruabon, soliciting further information. If you will kindly insert the following in your next, you will save me much trouble, and, at the same time, convey the information required.

Several attempts have been made to utilise the waste water from slop-stones, sinks, lavatories, &c., for flushing purposes, but, perhaps, with one exception, they have met with very little, if any, success.

One arrangement which, I believe, is in use in some towns, is to convey the waste water from the sink, &c., direct into the trap of the water-closet, which it is supposed to effectually flush. This arrangement cannot, however, I think, be considered to be successful from a bygienic point of view, as it frequently happens that after a deposit has been made it will have to remain in the trap until sufficient water has been passed down the sink to carry it away, which may easily be some hours; and then the quantity and force may not be sufficient to thoroughly cleanse the trap.

The prevailing idea has, however, been to bring about an automatical flushing of the closet by conveying waste water from the slop-stone into a receptacle or tumbler, constructed in such a manner that, when full, it should discharge its contents direct into, or perhaps a little above, the trap of the water-closet, and immediately afterwards right itself, or, in other words, return to its original position for the reception of subsequent discharge from the sink. This arrangement has not, however, to my personal knowledge, met with approval, on account, I suppose, of the delicacy of adjustment of the apparatus and the accumulation of sediment at the bottom of the tumbler, which together renders it inoperative.

The exception referred to is a recent introduction in this neighbourhood, and the mode of operation may be described as follows:—The waste water is conveyed from the sink, &c., into a tumbler, contained in a chamber or box situated a little above the trap of the closet, and which, when charged, remains so until actuated by a handle and connexion somewhat similar in construction to those of ordinary water-closets. On pulling the handle, the contents of the tumbler,—which may be of a capacity of four gallons, more or less,—are discharged, with some impetus, into the trap of the closet, which it flushes most effectually. When the tumbler has become charged, the surplus water overflows at the top into the outlet of the chamber or box, and thence through the trap into the drain. It will be observed that this constant flow of, say, 100 gallons of water per day through the closet trap, has a most salutary effect.

With respect to the cost of construction of water-closets on this principle, as compared with those generally in use, I may say there is a saving of 40 per cent.

In addition to the saving in the first cost of erection, it will be interesting to ascertain the amount which may be saved by using waste water in place of town's water. To do this we will assume we have a large town, having, amongst other arrangements 10,000 water-closets, which, we will suppose, serve 50,000 inhabitants,—five persons to each closet. Allowing that each person uses the closet twice in every twenty-four hours, and taking two gallons of water for each flush, 200,000 gallons of water per day would be required, or 73,000,000 gallons per year. This quantity at the low rate of 9d. per 1,000 gallons would amount to 2,737*l.* 10s.

In addition to those figures we should also take into consideration the reduced expenditure brought about by the reduction of the volume of sewage, which, if treated by the precipitation process, would amount to 300*l.* per year.

JAS. T. PEARSON.

Borough Engineer's Office, Burnley.

*** Our correspondent does not make it apparent how this system of flushing would answer where and when the waste water thrown on the sink or slop-stone is not sufficiently large or constant in volume to keep the "tumbler" always full and ready for discharge. We presume, however, that when the waste water runs short the "tumbler" could be replenished by turning on the draw-off tap over the sink for a moment.

NON-ACCEPTANCE OF LOWEST TENDER.

SIR,—We are the unlucky victims of another instance of the unjust application of the usual clause in bills of quantities:—"The lowest or any tender not necessarily accepted."

The facts are these. We were invited by the architect, under whom we are constantly doing a large quantity of work to tender for the erection of a saw-mill, &c., for the Improved Wood Block Pavement Company, at East Greenwich, and out of eleven builders we were the lowest by 30*l.* The Company, notwithstanding the competition was thus by invitation, set aside our tender in favour of the next lowest, that of Mr. Stubbs, their usual excavating and concrete contractor.

The Company's explanation, in reply to our protest and request for remuneration, is that "they were very particular to state in the invitation that the lowest or any tender may not be accepted" (which, however, is incorrect, although on the bill of quantities it was so stated). We think that this case is just such a one where the clause quoted operates unjustly, and therefore ask your kind insertion of this, as we think that the more these cases are made public the less will be the chance of their recurrence.

F. & H. F. HIGGS.

Loughborough Junction, March 3.

BUILDERS' DEPOSITS.

SIR,—Will you kindly allow me, through your valuable paper, to ask the seventeen builders who tendered for residence at Claygate, Surrey, and which you published in your issue of February 5th, if they had returned to them the 10s. deposit for quantities, and if not, why not?

Maidenhead, March 5. SNELL & Co.

WALKERN CHURCH, HERTS.

SIR,—When at this church a short time back, I was much grieved to see that the old newel stairs leading up to the bells had given place to a modern set of steps. The old stairway stood inside, under the tower, and was a curious piece of fifteenth-century oak framing. The church was admirably restored about three years ago by Mr. H. R. Gough, and the stairs then were left by him in excellent condition.

S. B. CHITTENDEN.

Stevenage, March 8.

The Student's Column.

FIELD WORK AND INSTRUMENTS.—XI.

Surveying Instruments.

IX.—THE THEODOLITE (*continued*).

THE telescope, as shown in figs. 3 and 4, is mounted to turn both upon a vertical and a horizontal axis, so that when the theodolite is in perfect adjustment it is not necessary for the objects which are ranged by the instrument to be either in the same vertical or in the same horizontal plane. To the underneath of the bottom horizontal plate or limb of the instrument, marked P, is attached a hollow body-piece, having a solid conical axis working within it, upon which the top horizontal plate or stage, marked O, is fixed. Both of these work concentrically within a jacket, which forms the connecting-piece to the parallel plates, as shown in fig. 3. The upper parallel plate is attached by a screwed end to this jacket, and the lower parallel plate is connected by a half-ball-and-socket-joint, the bearing being maintained by three or four elevating screws, which are marked U and Z. All the wearing surfaces are turned and bored so as to fit accurately, and the concentric pieces are secured by a washer and set screw, which is shown beneath the half-ball-and-socket joint. The parallel plates are held in a relative position to one another, in figs. 3 and 4, by means of a stop-block, within which one of the screws is placed, and the fine thread requisite for minutely adjusting the plates is provided with elongated nuts, which are bushed into the upper plate.

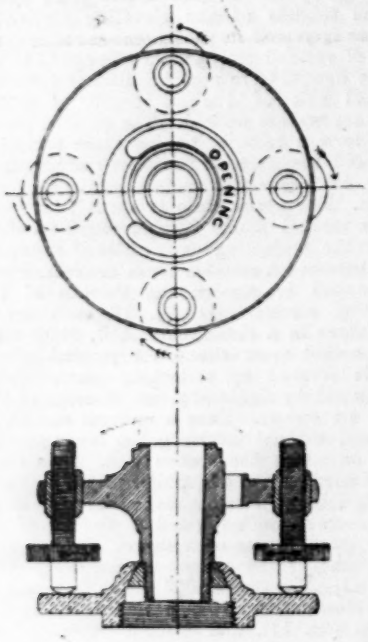
The screws marked U and Z have large milled heads provided for turning them. It must be remembered that in a four-screw combination of parallel plates the centre lines of opposite screws cross one another at right angles in plan. In adjusting the parallel plates, as shown in figs. 3, 4, 13, and 14, two opposite screws are held between the thumb and first finger of each hand, and are turned simultaneously in contrary ways one to the other, so that by moving the corresponding screws U U, or Z Z, both round towards the centre of the parallel plates, or both out from the centre of the plates, the upper plate is by this action lowered upon one side and raised upon the other. These screws should always work easily. If one of them appears hard to turn, it indicates that this screw is being unduly strained, and that it must not be further tightened until the opposite screw has been slightly loosened or slackened.

The delicacy obtained in the process of levelling, by the fineness of the pitch given to the threads of the elevating screws, is further increased in the three-screw arrangement of parallel plates, shown in figs 15 to 18, by the comparative greater distance from the vertical axis of the instrument at which these screws are worked. The parallel plates here form a tribach, having three radiating arms or branches, near the outer extremities of which the connecting adjustment screws are placed. The upper plate is about ¼ in. thick, with a vertical flange carried round its edge, and at the projecting extremities of each arm solid bosses of a suitable depth are cast, which are tapped to receive the threads of the elevating screws. In fig. 16 each screw terminates in a semicircular ball, which rests in a socket upon the lower parallel plate, and is secured by a locking plate, which is clamped by tightening one or more of the three set screws. Thus a uniform motion is obtained without indenting the lower parallel plate on which the screws rest. In a four-screw combination of parallel plates they are, on this account, often made to bear upon small thin pieces of leather, glued to the top of the lower plate, under each screw. In order to avoid bending the central connecting portion when adjusting the parallel plates by means of their elevating screws, a slot shown in the section (fig. 14), and marked "opening" in the plan (fig. 13), has sometimes been introduced into the upper plate. With a four-screw arrangement of parallel plates care must be taken that all four screws bear upon the lower plate or the instrument cannot be expected to work steadily. If one screw be moved more than the other, one of them is apt to be raised off its bearing plate, and the upper portion carrying the limb and stage will then rest upon the three remaining screws and be liable to rock. Hence both hands are necessary to be applied in adjusting the opposite screws, but with a three-screw arrangement of parallel plates the screws may be adjusted with one hand. The disposition to rock is also obviated, as the instrument requires at least three points to rest upon, and the elevating screws form the only attachment when locked between the tripod head and the instrument. In the arrangement of a three screw combination of parallel plates shown in figs. 17 and 18, it will be observed that any tendency to vibrate in working the instrument is kept below the locking plate, and that the locking plate, a plan of which is shown in fig. 19, assists to maintain the rigidity of the parallel plate connexion. Fig. 20 illustrates the detail attachment of one of the vertical screws, and fig. 21 shows the washer plate for securing the locking plate in position by means of the clamp screw. To counteract any wearing away that may occur after some time in the screw portion of the projecting arms to the upper plate, a vertical slit is generally made in the end of each arm and a side capstan-headed screw provided to each for clamping the joint.

In order to set up the theodolite, the lower parallel plate is screwed to a tripod head or centering stand, and the parallel plate screws are adjusted at the outset, so as to bring the upper and lower plates parallel to one another. The instrument is then so placed with its vertical axis plumb over a station point, that only a very slight range of obliquity to the parallel plates may be requisite when finally adjusting the bubbles to the centre of their run. Skill in working these screws can only be acquired by practice. They should be hand-tight, but never forced, otherwise their threads will soon be destroyed, and the perfect action of the instrument impaired. On the other hand, slack screws are as prejudicial to the working of the instrument as tight screws are dangerous to the mechanism. Fig. 22 shows a plan of a theodolite mounted upon a tripod stand. In the case of a four-screw combination of parallel plates, the levels marked Q and T are first turned parallel to the diagonal direction of two opposite parallel plate-screws. In the case of a three-screw arrangement of parallel plates, one level is set parallel to the direction of two adjacent parallel plate-screws, and then the other level will be parallel to a line at right angles to the line which joins these two screws,

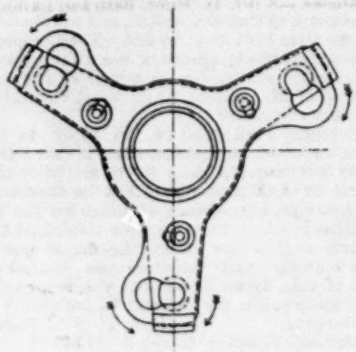
THE THEODOLITE

FIC 13



FIC 14

FIC 15



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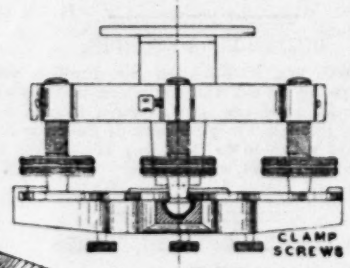

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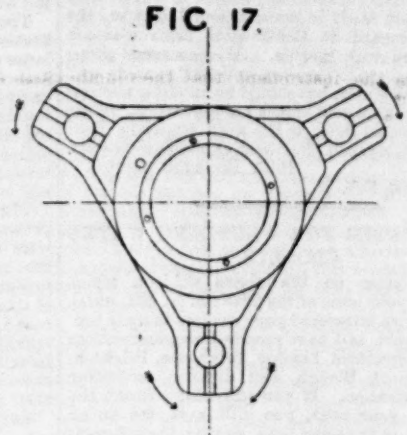
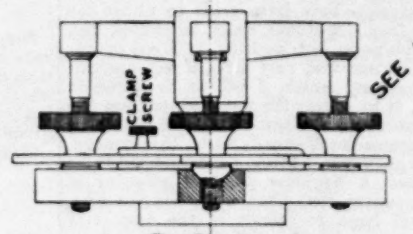
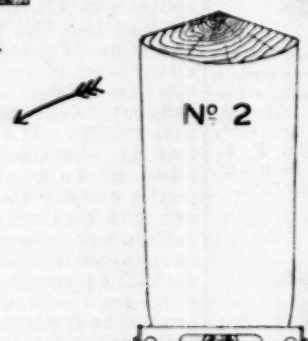
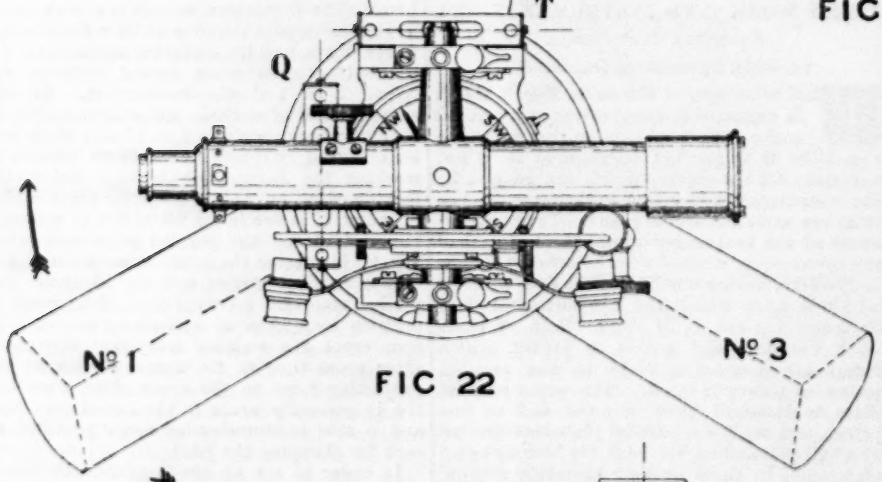


FIC 18







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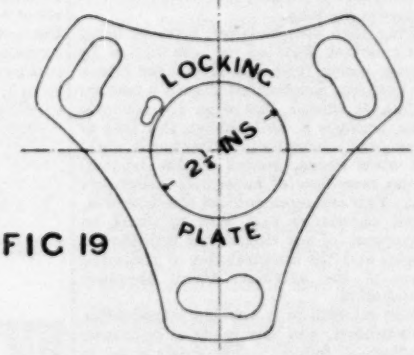

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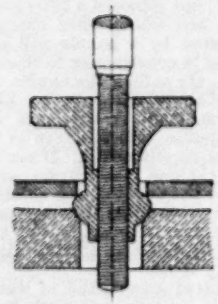

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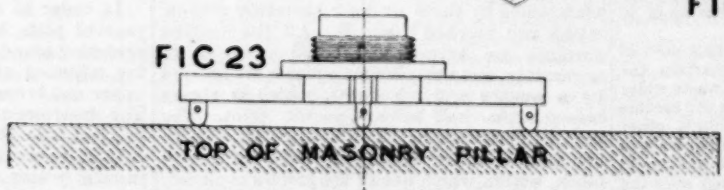

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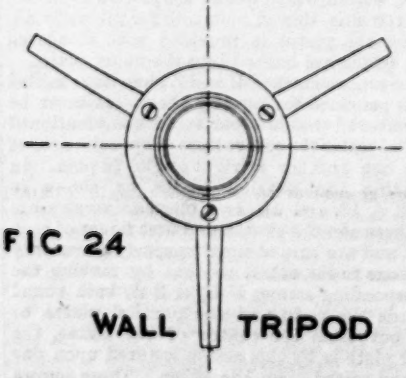

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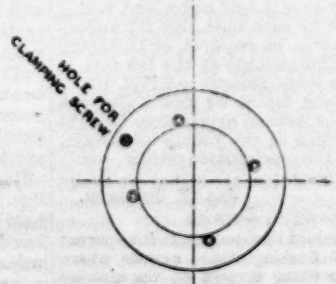
WALL TRIPOD



FIC 21

and which passes through the other screw. This will be evident upon comparing the centre lines which cross one another at right angles in figs. 13, 15, and 17. Having done this, the next thing is to set these bubbles approximately in the centre of their run by extending the legs of the tripod marked as No. 1, No. 2, and No. 3 in fig. 22, taking care at the same time so to finally place the instrument that the plumb-bob which is suspended from a hook or chain under the head of the instrument hangs freely exactly over the centre of the fixed station. To effect this it will be found the best plan in practice to consider one leg of the tripod fixed, and, while keeping the eye both on the station point and the bubbles, to work with the other two legs, taking hold of one with the left hand and the other with the right hand. Supposing that the leg marked No. 3 has been selected as the fixed one, the bubble marked Q is adjusted to the centre of its run by moving the leg marked No. 1 in the direction indicated by the arrows, and the bubble marked T by the leg marked No. 2. In thus adjusting the legs, care must be taken to lift each leg only just clear of the ground, no more, otherwise the level of the other bubble will be considerably affected thereby. The process must be repeated, first as regards one bubble, by means of its corresponding leg, and then with the other bubble by means of the other leg, until both bubbles appear level. Then, observing that the plumb-bob remains over the station point, press the legs gently but firmly in the ground, and finally adjust the levels Q and T by means of the parallel plate-screws.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

3,123, Locks and Latches. H. Rothery.

This invention consists chiefly of a combination of latch and bolt, which may be used separately. A tubular extension is arranged at the top of the lock into which a bolt is fitted: this may be drawn forward or backward or may be moved by the mechanism of the lock. It is actuated by a spring and may be fastened in its position either drawn forward or backward by a pin inserted through the door to retain it.

3,941, Door Knobs and Handles. W. G. Macvitie.

According to this invention, two squares are used in the connexion of the spindle to the knob; the spindle is square, and a brass cap fits on to it. This cap is fastened with a set screw, and when pushed or screwed home fastens the knob and spindle together.

4,101, Chimney Tops. S. B. Bamford.

The chimney-top which is the subject of this invention has a clear passage for smoke, and for the sweep's brush. It has also a vane with a rotating jacket so arranged that, in whatever direction the wind is, it produces an upward current of air in the chimney. No cowl is employed, but the jacket has several slits in it, which assist the updraught.

4,331, Roofing and Flushing Tiles. G. H. Couch.

The object of this invention is to produce a strong and light form of tile so as to more effectually resist the effects of wind and weather than those now employed. This is done by grooving in diagonal lines, and by a groove and tongue, which locks the tiles one with the other.

4,439, Cowl and Ventilator. J. A. Sharp.

According to this invention, a double funnel is used,—a trumpet-shaped funnel, designed to be fitted at the small end in a chimney, and surmounted by a second funnel bell-shaped. The form of these prevents the passage of a down-draught, while a free passage is maintained for the up-draught.

14,384, Ventilation, &c. S. S. Robson.

Below the ventilating opening the chimney is contracted. This will cause a strong current of air to pass through the ventilator, whether the chimney is heated by a fire or not, and there is no danger of smoke coming into the room through the aperture.

17,016, Windows. C. Flagatad.

According to this invention, the sashes are hung with hinged pivots and sliding blocks, so that the window-sashes may at will be set open in the middle or to one side of the window-opening. They open and shut with greatest ease, and are free from rattling. The windows can be cleaned from inside, and may be left open at the top without danger to children. Instead of the windows opening in the ordinary manner they project into the room in the form of a ≻. They have special devices for locking and raising. The invention is of Norwegian origin.

NEW APPLICATIONS FOR PATENTS.

Feb. 25.—2,912, J. Barber, Stove Grates.—2,913, D. Cowan, Cooking Ranges.—2,923, J. Kershaw, Machines for Cutting Mouldings.—2,957, T. White, Decoration of Tiles, Panels, &c.—2,992, H. Lewis, Hand or Foot Power Saw Benches.

Feb. 26.—3,035, W. Pierce, Latches.—3,064, D. Graham, Pneumatic Apparatus for Buildings.

Feb. 28.—3,073, J. Knowles & Sons, Window Sash Fastener.—3,107, H. Hunt, Bath and Lavatory Fittings.

March 1.—3,115, R. Grocott, Fastening Knobs to Spindles.—3,116, W. Clapham, Joiners' Clamps or Cramps.—3,120, E. Taylor, Attaching Door and other Knobs to Spindles.—3,121, T. Cudlipp, Stoves, Ranges, Grates, &c.—3,156, G. Capewell, Nail Extractors.—3,168, Trickett & Noad, Hydraulic Cements, Limes, Mortars, or Concretes.

March 2.—3,209, W. Hurndall, Paints for Ironwork, &c.—3,216, W. Wall, Door Bolt and Automatic Indicator.—3,220, H. Wethered, Regulator for Waste Closets.

March 3.—3,256, G. Jeffery, Roofing Cloth.—3,269, Ellis & Trippett, Appliance for Preventing Draughts, Dust, and Wet passing through the Bottoms of Doors, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

1,111, J. Colbran, Fireplaces.—1,836, R. Cozens, Door Handles and Spindles.—1,954, G. Smith, Door Fasteners and Locks.—2,291, Young & Moss, Ventilating Apparatus.—2,428, Sir G. Chubb and Others, Locks and Door Fastenings.—17,130, A. Mack, Artificial Boards, Slabs, Mouldings, &c., for Building Purposes.—268, Cabay and Lamal, Drain-Traps.—440, G. Butler, Window-sash Fasteners.—698, O. Elphick, Water-waste Preventers.—909, J. Jeffreys, Ventilators.—1,010, Hurdle and Miles, Ventilators.—1,708, Roberts and Osborne, Automatic Syphon Flushing Cisterns.—1,759, C. Ford, Surface Tiles for Walls, Ceilings, Floors, &c.—1,812, J. Martin, Draught-Preventer.—1,927, R. Scott, Decorating Detachable Wall and Ceiling Surfaces.—2,112, J. Harris, Water-closets and Ventilating their Soil-pipes.—2,160, Middleton and Brown, Flushing Water-closets.—2,223, W. Fryer, Combined Door Spring and Check.—2,281, J. and T. McCallum, Ventilation of Sewers and Drains.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

5,689, N. Locke, Self-locking Bolts for Doors.—5,916, Bott and Homer, Door Knobs or Handles, and Attaching same to Spindles.—6,019, R. Hall, Gas Brackets.—6,221, C. Williams, Fireproof Floors.—6,309, J. Reid, Lavatory Basins, Baths, Water-closets, &c.—8,624, J. Bennison, Chimney-pots.—8,822, M. Dement, Heating and Ventilating Apparatus.—8,957, S. Keoch and Wodson, Case Kiln for Bricks, &c.—11,170, J. Watson, Ventilators.—14,668, J. Watson, Ventilators.—14,922, J. West, Water-closets.—375, E. Sayers, Sash-fastener Securers.—1,470, J. Moore, Nails.—1,483, W. Johnson, Sash, Axle, and other Pulleys.—5,697, H. Weinreich, Ground Brushes for Painting.—5,975, A. Boult, Manufacture of Cement.—962, W. Thompson, Fastenings for Doors.—1,441, Braithwaite and Kirk, Bent Plates for Floors, Bridges, Columns, and Buildings.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

FEBRUARY 21.

By E. J. GAIRDNER.

Bournemouth—7, 8, and 9, Wootton-gardens, 75 years, ground-rent 30*l.* £1,800

FEBRUARY 28.

By G. A. WILKINSON.

Battersea—Ground-rents of 89*l.* 16s., reversion in 65 years 2,060

Kentish Town—27 and 29, Clarence-road, 49 years, ground-rent 9*l.* 800

Camberwell—15, 16, and 17, Westhall-road, 76 years, ground-rent 13*l.* 10s. 490

By A. JACKSON.

Oxford-street—The lease of No. 202, term 20 years 1,685

By C. CHANDLER & Co.

Rayleigh—Five freehold cottages in Church-street 265

MARCH 1.

By Messrs. WILLMOTT.

Harrow-road—10, Portnall-road, 91 years, ground-rent 7*l.* 380

By A. WATSON.

East Dulwich—5, Ondine-road, 88 years, ground-rent 6*l.* 6s. 310

By E. J. GAIRDNER.

Winchester—43, Southgate-street, 17 years, ground-rent 6*l.* 460

MARCH 2.

By GEO. GOULDSMITH, SON, & Co.

Belgravia—69, Chester-square, and stabling, 37 years, ground-rent 25*l.* 3,150

By PROTHEROE & MORRIS.

Snaresbrook—Holly Bush House and grounds, freehold 2,200

By H. HAINES & SON.

Clapton—71 Downs-road, freehold 2,490

MARCH 3.

By BRADEL & Co.

Paddington—An improved ground-rent of 58*l.* a year, term 56 years 1,230

By REYNOLDS & EASON.

Shoreditch—73, High-street, freehold 2,560

A block of freehold property in Boundary-street 1,190

Walham-green—31, Basuto-road, 93 years, ground-rent 5*l.* £230

By PRICKETT, VENABLES, & Co.

Hampstead-road—No. 100, and 41, George-street, freehold 1,860

Islington, Essex-road—A ground-rent of 12*l.*, term 35 years 135

By MABLER & BENNETT.

Dalston—2, Regent's-row, 56 years, ground-rent 3*l.* 310

Hornsey—68 and 70, St. Mary's-hill, freehold 440

7, Harringay-terrace, 59 years, ground-rent 4*l.* ... 330

By G. BRINSLEY.

Sydenham—The residence called Fernwood, 74 years, ground-rent 45*l.* 4s. 6d. 3,120

By NEWSON & HARDING.

Highbury—35, Highbury-place, freehold..... 1,400

Tottenham Court-road—12, Pitt-street, copyhold ... 1,100

Tufnell Park—25, Corrinne-road, 81 years, ground-rent 5*l.* 5s. 250

Clerkenwell—140, St. John-street, 36 years, ground-rent 8*l.* 415

Hornsey—10 to 18 even, Sunnyside-road, freehold... 2,205

King's-cross—5, 6, and 7, North-avenue, 47 years, ground-rent 3*l.* 10s. 395

Highbury—194, Highbury-hill, 89 years, ground-rent 6*l.* 320

Hornsey—78, Myddelton-road, freehold 235

By WORSFOLD & HAYWARD.

Dover—45, Castle-street, freehold 425

69 and 83, Maison Dieu-road, 73 years, ground-rent 8*l.* 6s. 860

Lower-row—Freehold cottage and bakehouse..... 200

Stroud-street—The lease of the Gun Hotel, term 8 years 150

MARCH 4.

By W. B. HALLETT.

Highbury-hill—48, term 77 years, ground-rent 12*l.* 505

Penge—Life interest in 75, 79, 85, and 89, Oakfield-road, and a policy for 800*l.*, life aged 35 years... 700

By BAKER & SONS.

Clerkenwell, Ray-street—The lease and goodwill of the White Swan 880

Dalston, Albion-square—The Albion Hall, 52 years, ground rent 60*l.* 1,195

Canning Town—30 to 44 even, Hemsworth-street, 78 years, ground-rent 22*l.* 500

By HORNCASTLE & PEMBER.

City—7, St. Mary Axe, 16 years, ground-rent 150*l.* 500

By T. B. WESTACOTT.

Camden-town—128, Camden-street, 52 years, ground-rent 6*l.* 635

Hampstead—8, Goldhurst-terrace, 91 years, ground-rent 8*l.* 485

By C. & H. WHITE.

Lambeth—46 to 60 even, Glashouse-street, copyhold 1,250

111 to 121 odd, Tyers-street, and 2, Miller's-lane, copyhold 550

Kennington—19 to 29, and 37, 39, and 41, White Hart-street, 44 years, ground-rent 20*l.*; and ground-rents of 6*l.* 10s., same term; and five policies 1,860

Peckham—Ground-rents of 24*l.* a year, reversion in 63 years 600

Lambeth—4 and 5, Lemon-place, freehold; and 1, 2, 3, 6, 7, and 8, Lemon-place, 60 years, ground-rent 30*l.* 625

Kennington—25, Prince's-square, 24 years, ground-rent 5*l.* 12s. 6d. 420

Wandsworth-road—108, 110, and 112, term 22 years, ground-rent 25*l.* 450

Clapham—18, 20, and 22, Courland-grove, 28 years, ground-rent 11*l.* 5s. 740

Camberwell-green—10 to 16 even, Brisbane-street, 77 years, ground-rent 15*l.* 450

MEETINGS.

SATURDAY, MARCH 12.

South Kensington Museum.—Mr. Whitworth Wallis on "Pompeian Architecture and Art." I. 5·15 p.m.

Edinburgh Architectural Association.—Visit to Liberton Tower, Inch House, &c.

MONDAY, MARCH 14.

Royal Institute of British Architects.—(1) Election of Royal Gold Medallist. (2) Professor Kerr on "Some Observations on the Architect's Functions in Relation to Building Contracts." 8 p.m.

Society for the Encouragement of Arts, Manufactures, and Commerce.—Adjourned discussion on Mr. William P. Marshall's paper on "Railway Brakes." 8 p.m.

Society of Antiquaries of Scotland (Edinburgh).—3 p.m.

TUESDAY, MARCH 15.

Society of Arts (Applied Art Section).—Mr. Alfred Phillips on "The Application of Gems to the Art of the Goldsmith." 8 p.m.

Institution of Civil Engineers.—Colonel E. Maitland, R.A., on "The Treatment of Gun-Steel." 8 p.m.

Statistical Society.—Mr. T. H. Elliott on "The Annual Taxes on Property and Income." 7·45 p.m.

Birmingham Architectural Association.—Address by the Vice-President, Mr. John Cotton. 7·30 p.m.

WEDNESDAY, MARCH 16.

Carpenters' Hall, London Wall (Free Lectures to Building Artisans).—Mr. Francis Chambers, F.R.I.B.A., on "Joinery." 8 p.m.

British Archæological Association.—(1) Dr. Woodhouse on "Memorials in Fulham Churchyard." (2) Rev. S. M. Mayhew on "Roman Sculptures found in London." 8 p.m.

Civil and Mechanical Engineers' Society.—Mr. Herbert D. Appleton, F.R.I.B.A., on "Rural Sanitary Authorities." 7 p.m.

Royal Meteorological Society.—Two papers, and Exhibition of Instruments. 7 p.m.

Society of Arts.—Mr. Percy Fitzgerald on "Machinery and Appliances used on the Stage." 8 p.m.

THURSDAY, MARCH 17.

Parkes Museum of Hygiene.—Dr. E. F. Willoughby on "George Varrentrapp, Sanitarian and Philanthropist." 5 p.m.

Society for the Encouragement of the Fine Arts.—Mr. J. W. Bradley on "Women, in the History of Illuminated Books." 8 p.m.

Edinburgh Architectural Association.—Mr. W. Scott Dalgleish on "Throndtjem Cathedral." 8 p.m.

FRIDAY, MARCH 18.

Architectural Association. — Mr. H. Lovegrove on "Architect and Contractor." 7·30.

Institution of Civil Engineers (Students' Meeting).—7·30 p.m.

SATURDAY, MARCH 19.

Architectural Association. — Visit to the National Gallery and the Houses of Parliament. 2·30 p.m. (See advertisement.)

South Kensington Museum.—Mr. Whitworth Wallis on "Pompeian Architecture and Art." II. 5·15 p.m.

Miscellanea.

The College of Preceptors. — We are informed that the New College Building in Bloomsbury-square will be opened by H.R.H. the Prince of Wales and H.R.H. the Princess of Wales, on Thursday, the 31st March.

Society of Engineers.—At a meeting of this Society, held on the 7th inst. at the Westminster Town Hall, Professor Henry Robinson, President, in the chair, a paper was read on "Bridge Floors: their Design, Weight, and Cost," by Mr. Edmund Olander, A.M.I.C.E. After showing the importance of the subject, and that it had not hitherto been specifically treated, the author described the various forms of flooring based on cross girder construction, analysed their strengths, and pointed out the variance in weight and cost between different examples. The great weight of some, owing to unnecessary thickness of ballast, and in many instances a too extravagant use of the materials of which the structures were composed, was shown to involve waste of iron in the girders of the bridges to enable them to carry the undue load. The floorings noticed were those of timber alone, of timber on cross girders, and of cross girders with rail-bearers. Passing on to the modern system of trough floors, he analysed the strength and cost of nine different forms, and discussed the important question of the length over which the moving load should be considered to be spread. In connexion with this he gave the details of two tests by dead weight, which had been carried out under his direction, and which demonstrated the strength of the new forms. He showed also that they were more economical as well as more durable than the old systems. The results of all his calculations were collected in a comparative summary, giving numerous details, and the paper was illustrated by a large number of diagrams and drawings.

Sale of the late Sir John Kelk's London Leaseholds.—On Wednesday Messrs. Farebrother, Ellis, Clark, & Co. offered for sale, at the Auction Mart, the London leasehold properties of the late Sir John Kelk, the eminent builder and contractor, of the well-known firm of Kelk & Lucas. The several properties submitted are all situated at the West End, and comprise a mansion in St. James's-square, at the corner of King-street, arranged in suites of residential chambers, held for an unexpired term of fifty-seven years, at a ground-rent of 100*l.* per annum; also five dwelling-houses in Margaret-street, Cavendish-square, on the Portland Estate; a set of stabling in Grosvenor-square; the lease of No. 80, Eaton-square, and improved ground-rents in Eaton-square, amounting to 104*l.* per annum. Sir John Whittaker Ellis, M.P., conducted the sale. The set of stabling at the rear of Grosvenor-square, underleased for a term of twenty one years from December, 1881, at a rent of 150*l.* per annum, was sold for 2,525*l.* The leasehold properties in Margaret-street, Cavendish-square, were submitted in six lots. They were described as held from the Duke of Portland for an unexpired term of eighteen years, at an aggregate ground-rent of 135*l.* per annum, and under-leased to capital tenants at rents amounting to 595*l.* per annum. They were sold at prices amounting together to 6,000*l.* The biddings for the mansion in St. James's-square commenced with an offer of 9,000*l.*, and 15,600*l.* having been reached without any further advance the property was withdrawn. The Eaton-square property was submitted in three lots. An improved ground-rent of 48*l.* per annum, on 65, Eaton-square, held for an unexpired term of thirty-seven years, was sold for 730*l.*; and a similar improved ground-rent of 60*l.* per annum on the adjoining house realised 950*l.* The town mansion, No. 80, Eaton-square, adjoining the residence of the Duke of Bedford, held by under-lease from Mr. Cubitt for an unexpired term of thirty-two years, at a ground-rent of 64*l.* per annum, was withdrawn at 10,600*l.*

Progress of the Preston New Docks and River Works.—Mr. Walker, the contractor for the new docks and for the improvement of the river Ribble at Preston, now going forward, has about 1,000 hands at work, and very active progress is being made with the undertaking. The works in connexion with the docks are in a very advanced state. The south wall of the 40-acre dock is nearly completed, whilst other portions of the structure are being actively pushed forward. As regards the deepening of the channel of the river to a depth of from 26 ft. to 30 ft., this section of the undertaking is being proceeded with. The plans involve the deepening of the channel to the extent of twelve miles in length, in the direction of the Irish Sea, and this is being carried out by powerful dredgers. Upwards of 1,000 cubic yards of material are removed by the dredgers weekly. The material consists chiefly of clay and boulder stones, some of the latter being of great size. It is stated that a few weeks ago one of these boulders, weighing three tons, was taken from the bed of the river and placed on the deck of the dredger. In anticipation of the completion and opening of the docks some of the great railway companies are taking steps for securing communication with them for the coal and other traffic. The London and North-Western Company have already a branch railway from their line at Preston to the Ribble, and a staff of surveyors in the employ of the Company has lately been busily engaged in preparing surveys and plans of intended new lines connecting with the docks, and that considerable extensions are about to be carried out by the railway company in order to provide facilities for the shipping traffic from the docks. The Manchester, Sheffield, and Lincolnshire Company are also taking similar steps for connecting their system with the docks by means of their Wigan and Preston Junction Railway, which is about to be commenced.

British Archæological Association.—At the meeting of this Association on the 3rd inst., Mr. Thos. Morgan, F.S.A., in the chair, the Rev. S. M. Mayhew exhibited a variety of antiquities recently found in various parts of the City, the most remarkable being a sculptured bust, in marble, of a young Roman lady, found at Walbrook. The material is marble, and the features are of great beauty. Some burnt Samian ware was found at the same time, while at a lower level and at no great distance a flint instrument was discovered, one of the few prehistoric relics which have been met with in London. Mr. Cecil Brent, F.S.A., exhibited some curious Merovingian bronze personal ornaments, similar in general character to some of early Saxon date found in England. Mr. Round exhibited a unique impression of the seal of Warwick, the King Maker, which, with the warrant to which it is attached, the latter bearing Warwick's autograph, was recently found in a loft over a stable, at the seat of a relative of Mr. Round's, in Essex. Mr. Earle Way produced some Roman pottery found in Southwark, and Mr. Loftus Brock, F.S.A., described a very early vase found at Cyprus. The first paper was on the Roman Villa, at Yatton, Somerset, by the Chairman. The villa stood on very low-lying ground below the level of the present bed of the River Yeo, only about 50 ft. distant. The rooms which have been excavated have curious relation to two parallel walls which have been traced up to the modern river bank. There are two pavements of very elegant designs, much injured, one of which has a floriated cross in the centre. The second paper was by Mons. Rœssler, on recent discoveries at Fécamp. Several discoveries of Roman pottery have been made, many of the objects being of great beauty. The tomb of a young Roman lady has also been found, the date being about A.D. 400. The epitaph of William, third Abbot of Fécamp, was described. It is a curious example of the use of Roman numerals, the date being 1107. The paper was read in English by the author. The Rev. Dr. Hooppell described a curious Roman balance, in perfect condition, of bronze, which has recently been found at Catterick, Yorkshire.

New Malden Sewerage.—The Local Board of New Malden have decided to carry out a scheme of sewage designed by Mr. Lockwood Heward, C.E., and have accepted the tender of Messrs. B. Cooke & Co., of Battersea, the contract amount being about 13,000*l.*, subject to the sanction of the Local Government Board being obtained.

Sale of Brickfields and Building Land near Tilbury.—On the 4th inst. Messrs. Baker & Sons offered for sale, at the Auction Mart, a freehold property at Corringham, near Tilbury, covering an area of 136 acres, and comprising the "Tilbury Brickfields," occupying nearly 55 acres, and the Brickhouse Farm, 81 acres in extent. The property was offered in two lots, the first lot submitted being the Tilbury Brickfields. It was stated that brick earth and sand of the best quality abounded on the estate. Included in the sale were the worksheds and several other buildings incidental to the working of a brickfield. The auctioneer stated that the land had, until recently, been in the occupation of the Tilbury Brickfields Company, and that having in view the proximity of the estate to the Tilbury Docks, and the extensive building operations which were taking place in the neighbourhood, a company would always find a ready sale for bricks and tiles manufactured by them. The conditions provided that certain carpenters' shops and moulding sheds, also a quantity of machinery and other plant, would have to be taken by the purchaser at a valuation. The biddings commenced at 2,000*l.*, and the property was ultimately sold for 3,625*l.* The Brick House Farm, of 81 acres, was next submitted. It was sold for 2,500*l.*, the total proceeds of the estate, including the brickfields, being 6,125*l.*

Cemetery Chapel, Edmonton.—The new cemetery chapel, in connexion with the Church of England in the Edmonton Cemetery, was consecrated on Monday, the 21st ultimo, by the Bishop of Bedford. The Nonconformist chapel is connected with it by a gateway surmounted by a wooden flèche. The style generally is fifteenth-century Gothic. The walls are of brick faced with Kentish rag, the dressings of Sumsion's Monk's Park stone. The windows are throughout of lead quarry glazing, by Mr. W. Ramsey, of Farringdon-street, E.C. The hot-air stoves were supplied by Messrs. W. Poore & Co., of Cheapside. In a detached building, water-closets, &c., are provided, also mortuary and tool-house. Mr. W. Hickinbotham was the contractor, and Mr. T. Peto Ward clerk of the works. The cemetery was provided by the Edmonton Local Board.

Monument to the late Dean of Chester. A brass in memory of the late Dean Howson has been fixed to the wall of the north aisle of the choir of Chester Cathedral. The brass is contained in a sunken panel of Runcorn stone with carved Early English border, and bears the following inscription:—"To the memory of John Saul Howson, D.D., late scholar of Trinity College, Cambridge, and from 1867 to 1885 Dean of this Cathedral Church, which, mainly by his devoted efforts, was during those years recovered from decay to a state of beauty and fitness for the worship of God and for the ministry of the Word. Ob. Dec. 15, 1885. 'Crux est potestas Dei.'" The design is by Mr. Blomfield, of London.—*Times.*

The East Sussex and West Hants Infirmary, Chichester, was re-opened on Tuesday, after having been closed in sections for three months, during the renewal and remodelling of the sanitary arrangements and drainage of the building, at a cost of about 1,000*l.* The work has been designed and carried out by Mr. Mark H. Judge, A.R.I.B.A., and on Tuesday Mr. Judge went through the whole of the work with the committee and governors of the institution, explaining in detail the arrangements, including a new system of sub-irrigation drains which has been substituted for the cesspools which had hitherto existed. Several members of the staff were also present, and all expressed their satifaction at the great improvements that had been effected.

Pompeii, Pompeian Architecture and Art.—The Department of Science and Art announce that three lectures on this subject will be delivered by Mr. Whitworth Wallis, F.R.G.S., in the Lecture Theatre of the South Kensington Museum on Saturday afternoons, the 12th, 19th, and 26th of March, at 5·15 o'clock. Each lecture will be illustrated by plans and views shown by the oxy-hydrogen light.

The Prudential Assurance Company.—The summary of the thirty-eighth annual report of this company, which appears in our advertisement columns, contains figures which testify to the remarkable development of its business, particularly in what is known as the "Industrial Branch."

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Greenheart, B.G. ....ton	6 10 0	7 10 0
Teak, E.I. ....load	9 0 0	14 0 0
Sequoia, U.S. ....foot cube	0 2 3	0 3 0
Ash, Canada ....load	3 0 0	4 10 0
Birch ,, ...	2 5 0	3 10 0
Elm ,, ...	3 10 0	4 10 0
Fir, Dantsic, &c.	1 10 0	4 0 0
Oak ,, ...	3 10 0	4 10 0
Canada	3 0 0	6 0 0
Pine, Canada red	2 0 0	3 10 0
,, yellow	2 5 0	4 0 0
Lath, Dantsic ....fathom	3 0 0	5 0 0
St. Petersburg	4 0 0	5 10 0
Wainscot, Riga ....log	2 15 0	4 0 0
,, Odessa, crown....	3 5 0	3 7 6
Deals, Finland, 2nd and 1st...std.100	7 0 0	8 0 0
4th and 3rd	5 10 0	6 10 0
,,	5 10 0	7 0 0
Riga	8 10 0	14 0 0
St. Petersburg, 1st yellow	7 0 0	8 0 0
,, 2nd ,, ...	6 0 0	9 0 0
,, white	6 0 0	15 0 0
Swedish	7 0 0	16 10 0
White Sea	17 0 0	27 0 0
Canada, Pine, 1st	11 0 0	16 0 0
,, ,, 2nd....	6 0 0	8 0 0
,, ,, 3rd, &c....	8 0 0	10 0 0
,, Spruce, 1st	5 0 0	7 0 0
,, 3rd and 2nd	5 0 0	7 0 0
New Brunswick, &c.	4 0 0	12 0 0
Battens, all kinds	0 8 0	0 11 6
Flooring Boards, sq. 1 in., prepared, First	0 6 6	0 7 6
Second	0 5 0	0 6 0
Other qualities	0 0 3	0 0 3½
Cedar, Cuba ....foot	0 0 2½	0 0 3½
Honduras, &c.	0 0 2	0 0 3
Australian	0 0 4	0 0 6
Mahogany, Cuba	0 0 4	0 0 6
St. Domingo, cargo average	0 0 3½	0 0 4½
Mahogany, Mexican, cargo av.	0 0 4	0 0 6
Tobasco ,, ...	0 0 4	0 0 6
Honduras ,, ...	0 0 6	0 0 8
Maple, Bird's-eye	7 0 0	10 0 0
Rose, Rio ....ton	6 0 0	10 0 0
Bahia....		

TIMBER (*continued*).	£. s. d.	£. s. d.
Box, Turkey ....ton	5 0 0	15 0 0
Satin, St. Domingo ....foot	0 0 6	0 0 10
Porto Rico	0 0 6	0 0 10
Walnut, Italian	0 0 4	0 0 5
METALS.		
IRON—Bar, Welsh, in London...ton	4 7 6	4 15 0
,, ,, in Wales	4 2 6	4 7 6
,, Staffordshire, London	5 10 0	6 0 0
Sheets, single, in London	6 15 0	8 10 0
Hoops ,, ...	6 0 0	7 0 0
Nail-rods ,, ...	5 15 0	6 10 0
COPPER—		
British, cake and ingot ....ton	42 10 0	43 0 0
Best selected	43 10 0	44 10 0
Sheets, strong....	50 0 0	51 0 0
Chili, bars	39 5 0	39 15 0
YELLOW METAL ....lb.	0 0 4½	0 0 4½
LEAD—		
Pig, Spanish ....ton	12 12 6	0 0 0
English, common brands....	12 17 6	0 0 0
Sheet, English	13 15 0	14 0 0
SPELTER—		
Silesian, special ....ton	14 7 6	0 0 0
Ordinary brands....	14 5 0	0 0 0
TIN—		
Straits....ton	103 15 0	0 0 0
Australian	103 0 0	0 0 0
English ingots	106 0 0	0 0 0
OILS.		
Linseed ....ton	20 5 0	20 10 0
Cocoanut, Cochin	35 0 0	36 0 0
Ceylon	26 0 0	0 0 0
Palm, Lagos	22 10 0	0 0 0
Rapeseed, English pale	22 10 0	0 0 0
,, brown	21 0 0	21 5 0
Cottonseed, refined	18 5 0	19 10 0
Tallow and Oleine....	25 0 0	45 0 0
Lubricating, U.S.	5 0 0	6 10 0
,, refined	5 0 0	12 0 0
TURPENTINE—		
American, in casks ....cwt.	1 8 0	0 0 0
TAR—		
Stockholm ....barrel	0 15 0	0 15 6
Archangel	0 12 6	0 0 0

CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Supply of Stone, Gravel, &c....	Hendon Local Board ...	S. S. Grimley....	March 14th	ii.
Works and Materials	Chiswick Local Board...	A. Ramsden	March 16th	xii.
Station Buildings, near Birmingham	L. & N. W. Rail. Co....	*Official*	do.	ii.
Road-making and Paving Works	Hammersmith Vestry...	do.	do.	ii.
Street Materials	St. Martin's(Westmnstr) Vestry	H. Jacques....	March 17th	ii.
Alterations to Boys' School	St George-in-the-East Guardians	Wilson, Son, & Aldwinckle	March 18th	xii.
Building Eight Houses at Parkeston	Thos. Moy, Esq.	H. A. Wooster Reeves	March 19th	xii.
Road-making, &c.	Hornsey Local Board...	T. De Courcy Meade ...	March 21st	xii.
Boilers	Tottenham Local Board	— De Pape	March 22nd	ii.
Painting, Whitewashing, &c....	St. Giles's, &c., Guardns	*Official*	do.	xii.
Annual Contracts	Lewisham Bd. of Wks.	do.	do.	xii.
Guernsey Granite Spalls	West Ham Union	do.	March 23rd	xii.
Repairing Bridges, &c.	County of Brecknock ...	do.	March 25th	ii.
Works and Materials	War Department.....	do.	do.	ii.
Artesian Well	Com. of Sewers.....	do.	do.	ii.
Erection of New Works	Peat Moss Litter Co. ...	Brundell, Simmons, & Co	March 26th	xii.
Erection of Water Tower	Liverpool Corporation	G. F. Deacon....	March 28th	ii.
Painting, Repairs, &c.	City of London Union	*Official*	do.	xii.
Erection of Church, Swansea....	The Committee.....	Habershon & Fawckner	March 29th	xii.
Brick and Pipe Sewers, &c.	Leicester Corporation	J. Gordon	March 31st	ii.
Road-making and Materials	Chiswick Local Board...	A. Ramsden	April 6th	xii.
Alterations and Additions to Town Hall....	Grimsby Town Council	E. W. Farebrother.....	April 11th	xii.
New School for Girls, Rochester	The Governors	J. W. Nash	Not stated...	xii.
Marble Staircases	Glasgow Corporation ...	*Official*	do.	xii.
Enlargement of School and other Works	Schl. Board for London	do.	do.	ii.
Erection of Hospital....	Harrogate Bath Hospital	Worthington & Elgood	do.	ii.
New Road, with Sewer and Surface-Water Drains	Southwark Freehold Land, &c., Assoc. ...	W. A. Curnock.....	do.	ii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Parish Surveyor....	Liverpool Vestry	500*l.*	March 24th	xvi.
Clerk of Works	Civil Service Com.	Not stated	March 30th	xvi.

TENDERS.

BERMONDSEY.—For re-erecting stabling, with warehouse floors over, in Rothsay-street, and sundry alterations and repairs to adjoining premises, 23, Bermondsey New-road, for Mr. J. E. Armfield. Mr. Edward Crosse, architect, Bermondsey-square. Quantities not supplied :—

S. Kipps, Long-lane	£440 19 0
W. Shepherd, Bermondsey	416 0 0
Spencer & Co., Lambeth	390 0 0
A. White & Co., Rotherhithe	383 0 0
J. Tyerman, Walworth	381 0 0
F. & H. F. Higgs, Loughborough	380 0 0
J. Almond, South Bermondsey	349 0 0
W. Everitt, Streatham (accepted)	320 0 0

BRIGHTON.—For additions and repairs at 2½ to 8, Market-street, for Major C. G. Boxall. Messrs. Puttick & Puttick, architects, Brighton :—

Cheesman & Co., Brighton (accepted)	£360 0 0

BRIXTON.—For the erection of warehouses, &c., Loughborough Junction, for Messrs. Osborne & Young. Mr. R. Cruwys, architect, Brixton :—

Marsland	£3,285 0 0
Holliday & Greenwood	5,977 0 0
F. & H. F. Higgs....	5,800 0 0
Balsam Bros....	5,650 0 0
Dickinson	5,550 0 0
Rodwell (accepted)	5,500 0 0

BROADSTAIRS.—For alterations and additions to York Gate House, Broadstairs, Kent, for Dr. Jackson. Mr. Fras. L. Pither, architect. Quantities supplied :—

Lockwood, Westgate	£915 0 0
Martin, Ramsgate	883 0 0
Kingerlee, Oxford	880 0 0
Kimberley, Banbury	863 0 0
May, Broadstairs....	850 0 0
Addis, Hounslow	840 0 0
Castle & Martin, Oxford	808 0 0
Grubb, Bromley	8 5 0 0
Dawson, Broadstairs	791 0 0
Neave & Neave, London	745 0 0
Newton & Idle, Clapham	713 0 0

CHATHAM.—For the construction of roads, with surface-water drainage, on the Slicketts-hill Estate of the National Liberal Land Company, Limited. Mr. George Pooley, surveyor, Charing-cross :—

Stephen Kavanagh, Surbiton	£350 0 0
William Nicholls, Wood-green	323 0 0
Samuel Chafen, Rotherhithe	265 0 0
James C. Trueman, South Hackney ...	235 0 0
George Anger, Luton, Chatham	231 18 0
William Carter,* Leytonstone....	213 16 3

[Surveyor's estimate, 250*l.*]

* Accepted.

CHELSEA.—For sanitary and decorative alterations and additions at 33, Cadogan-place, for the Hon. Mrs. Goulburn :—

Godfrey, Giles, & Co., Park-street, Grosvenor-square (accepted)	£230 0 0

FOREST-GATE.—For the erection of two cottages at corner of Capel-road and Latimer-road, for Mr. W. H. Watson. Mr. James F. Wesley, architect, Forest-gate :—

J. W. Wyles	£745 0 0
A. W. Nicholls....	739 0 0
W. Parsons	735 0 0
A. M. Kydd	710 0 0
W. Watson	696 0 0
G. Baney....	625 0 0

FULHAM.—For reconstructing the drainage of the Western Hospital, Seagrave-road, Fulham, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects, 15, Leadenhall-street. Quantities not supplied :—

Bell, Tottenham	£2,373 0 0
J. Knight, Westminster....	1,897 0 0
Saunders, Fulham	1,880 0 0
W. Johnson,* Wandsworth-common	1,878 0 0

* Accepted.

HORNSEY.—For the construction of new stoneware pipe sewers, for the drainage of the northern portion of the District of Hornsey, for the Hornsey Local Board. Mr. T. De Courcy Meade, engineer and surveyor :—

Mowlem & Co., Westminster	£3,566 0 0
Dunmore, Crouch-end	3,439 0 0
Pizzey, Hornsey	3,354 0 0
Osenton, Erith	3,298 0 0
Cunliffe, Dorking....	3,096 0 0
Marshall, Brighton	3,090 0 0
Nicholls, Wood-green....	2,989 0 0
Bloomfield, Tottenham	2,982 0 0
Cooke & Co., Battersea....	2,946 0 0
Neal,* Wandsworth-common....	2,649 0 0

* Accepted.

KENSINGTON.—For carrying out additions and alterations to house, 14, Kensington Palace-gardens, for Mr. H. J. Solomon. Messrs. Joseph & Smithem, architects :—

Herne	£3,097 0 0
Patrick & Son	2,869 0 0
Heeps	2,348 0 0
Patman & Fotheringham	2,277 0 0

KILBURN.—For repairing works, &c., to 36, 38, 40 44, 50, 55, 57, 59, 61, 69, 71, Victoria-road, Kilburn. Mr. Delissa Joseph, architect, Basinghall-street :—

Kilby & Gayford	£1,046 0 0
B. E. Nightingale....	818 0 0
J. W. Falkner	695 0 0
H. S. Foster	690 0 0
A. W. Hammond....	526 0 0
John Allen & Son (accepted)	498 0 0

LONDON.—For alterations to the sanitary arrangements at 66, Chester-square, for Col. Clayhills. Mr. T. W. Rhodes, architect, Cornhill :—

Winser & Co., Buckingham Palace-road (accepted)	£115 0 0

LONDON.—For Portland stone front to 28, 30, 32, and 34, Jewin-crescent. Mr. Delissa Joseph, architect, Basinghall-street :—

Gilbert Seale....	£563 0 0
George Herridge (accepted)....	465 0 0

LONDON.—For building new water-closets, &c., and for general repairs to 167, 169, 171, 173, and 175, Hampstead-road, for Mr. W. Wilson. Messrs. Thos. Chatfeild Clarke & Son, architects :—

Heeps	£1,131 0 0
Muston & Son	1,130 0 0
Westley & Co.	1,113 0 0
Worsley & Co.	997 0 0
Philps & Bisiker	996 0 0
Mattock Bros.	977 0 0

LONDON.—For carrying out alterations and repairs to premises, 292, High Holborn, for Mr. W. Baker. Mr. C. Reilly, architect :—

Heeps	£789 0 0
Smith & Sons....	779 0 0
Morton	756 0 0
Frost	710 0 0
Staines	688 0 0
Kingsford	682 0 0

PLAISTOW.—For Wesleyan sunday schools, Plaistow. Mr. J. H. Carte, architect. Quantities supplied :—

Maddison	£1,375 0 0
A. Reed	1,299 0 0
Morter & Sons	1,280 0 0
George Gill	1,200 0 0
W. Smith	1,189 0 0
Harris & Wardrop	1,184 0 0
W. & H. Castle....	1,149 0 0
George Chicken	1,125 0 0

RICHMOND.—For railings, gates, &c., at the Richmond Hill Public Pleasure Gardens. Mr. Walter Brooke, A.M.I.C.E., Town Surveyor :—

Thomas Brown & Co.,* Birmingham...	£584 19 9

* Accepted.

ROTHERHITHE.—For rebuliding house in Adam-street, Rotherhithe, for Mr. J. McLean :—

A. White & Co. (accepted)	£300 0 0

[No other Tenders were sent in.]

STOKE NEWINGTON.—For erecting house and stables, in Manor-road. Quantities supplied. Mr. Jno. Hamilton, architect, Bishopsgate-street :—

	House.	Stable.
Harper	£2,573	£275
Weeks	1,918	450
Hayworth	1,884	399
Sharp....	1,811	388
Shurmur	1,786	396
Scott	1,689	413
Exton & Burton, Birkbeck Works, Kingsland	1,584	339

SOUTHAMPTON.—For warehouse extension, Queen's-buildings, Southampton, for Mr. Edwin Jones. Mr. James Lemon, F.R.I.B.A., architect :—

Brinton & Bone	£4,683	0	0
Stevens & Sons	4,639	0	0
Buil, Sons, & Co.	4,600	0	0
H. J. Sanders (accepted)	4,598	0	0

[All of Southampton.]

STONEY STRATFORD (Bucks).—For new house and shop, High street, Stoney Stratford, for Mr. Arthur Hall :—

White, Stoney Stratford	840	0	0
Green Bros., Northampton	750	0	0
Wingrove, Northampton	717	6	0
Mitchell, Northampton	655	0	0
Worrell, Wolverton	650	0	0
Wilson & Roberts,* Wolverton	634	10	0

* Accepted.

SUNDERLAND.—For proposed hospital for infectious diseases, for the Borough of Sunderland. Architect, Mr. R. S. Rounthwaite, Borough Engineer. Quantities by Mr. G. D. Irwin, Sunderland :—

G. H. Hodgson, Sunderland	£14,651	10	0
J. H. Thorp & Son, Leeds	14,417	0	0
G. Swan, Sunderland	14,393	0	0
Craven & Umpleby, Leeds	14,329	0	0
C. Myers, Leeds	14,300	0	0
S. Warburton, Manchester	14,300	0	0
Walter Scott, Sunderland	14,249	0	0
E. H. & G. Allison, Sunderland	13,900	0	0
Thos. Lumsden, Jarrow-on-Tyne	13,898	0	0
Joseph Elliott, North Shields	13,827	0	0
T. P Shafoe,* Sunderland	13,796	1	8
Geo. Douglas, Sunderland	13,425	19	11
W. & R. Blackett,† Bishop Auckland	12,854	0	0
G. & F. Hildrey, Sunderland (withdrawn)	11,200	0	0

* Accepted.
† Amended to 13,454*l*.

SUSSEX.—For additions to the shooting-box, Horeham Hurst, Sussex. Mr. H. Percy Monckton, architect, Walbrook :—

T. S. Todd, Bexhill-on-Sea	£993	0	0
Allcorn & Sons, Shipbourne, Kent	920	12	8
Cornwell & Son, Eastbourne	845	0	0
D. Ashdown, Horeham-road (accepted)	841	10	0

Stabling.

D. Ashdown, Horeham-road (accepted)	£250	0	0

Entrance Lodge.

D. Ashdown, Horeham-road (accepted)	£100	0	0

WORTHING.—For the erection of new offices and Board-room at Worthing, for the Worthing Local Board. Mr. Walter Horne, surveyor :—

J. Reynolds, Brighton	£2,195	0	0
S. Sabey & Son, Islington	1,994	0	0
J. Crooke & Son, Northampton	1,887	0	0
J. Wernham, Plumstead	1,885	0	0
C. Cornwall & Son, Eastbourne	1,880	0	0
J. Roberts, South Norwood	1,850	0	0
Rowland Bros., Horsham	1,840	0	0
A. Burrell, Littlehampton	1,820	0	0
P. Peters, Horsham	1,778	0	0
J. Longley, Crawley	1,750	0	0
A. J. Wright, Broadwater	1,648	10	0
W. H. Sawle, Worthing (accepted)	1,529	0	0

SPECIAL NOTICE.—Lists of Tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, W.C., *not later than Four p.m.* on THURSDAYS.

TO CORRESPONDENTS.

Registered Telegraphic Address, "THE BUILDER, LONDON."

RECEIVED.—A. G. D.—B. F.—H. G.—J. S. (next week).—E. K.—M. H. J.—W. S. L. (thanks).—J. P.—W. B.—J. D., jun.—W. L. C.—(see Mr. Pearson's letter).—K. J. B.—G. B. W. (we do not know).—F. J.—C. A. M.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PUBLISHER'S NOTICES.

Registered Telegraphic Address, "THE BUILDER, LONDON."

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PREPAYMENT IS ABSOLUTELY NECESSARY.

**** Stamps must *not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, Covent-garden, W.C. to

DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office,* 46, Catherine-street Covent Garden, W.C. *free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN CIRCULATION, is issued every week.

FIRE BRICKS.

BEST STOURBRIDGE FIRE BRICKS, and Cement Fire Clay, Gas Retorts, Muffles, &c. Fire Bricks and Blocks for the Highest Heats, for Iron Blast Furnaces, Forge, Rolling, Puddling, and Steel Furnaces, Flint Glass Furnaces, Roasting and Refining Furnaces, Chemical Works, Coke Ovens, &c. Boiler Seating Blocks, Flue Covers, Locomotive Bricks, Tuyeres, Steel Runners, Grate Backs. Special Sizes and Shapes made to Engineers' Drawings.
Prices quoted to any Port or Railway Station.
London Agents :—
R. CULL & SON, *Palmerston-buildings, E.C.*

GLAZED BRICKS.

OATES & GREEN, HALIFAX.
GLAZED BRICKS (White and Coloured), Special Salt-glazed Bricks Sanitary Tubes, Glazed Earthenware Sinks, Cattle, Sheep, and Pig Troughs, Horse Mangers, Patent Automatic Trough Closet, Patent Flush Tank. Ventilating Bricks, Patent Ventilating Gullies and Traps, Patent Chimney Pots for Down Draughts.
Six Prize Medals. Copies of Testimonials sent if required.
London Agents :—
R. CULL & SON, Palmerston-buildings, E.C.

BLUE BRICKS.

THE KETLEY BRICK COMPANY, KINGSWINFORD, Staffordshire. Manufacturers of Blue Bricks.
London Agents :—
R. CULL & SON, Palmerston-buildings, E.C.

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Lime, Cement, Bricks, Slates, Laths, Hair, Plaster, Wall Copings, Channel Bricks, Blue and Red Ridges. Red Plain Tiles and Pan Tiles, Closet Pans and Traps. Bends, Junctions, &c. all sizes. Chimney-Pots, Red and White. PRICES on APPLICATION.
R. CULL & SON'S Stores, Railway Arches, London-street, Bethnal Green Station, E.
Chief Office :—72, Palmerston-buildings, Old Broad-street, E.C

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 18s. per annum PREPAID. To all parts of Europe, America, Australia, and New Zealand, 26s. per annum. To India, China, Ceylon, &c. 30s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher, No. 46, Catherine-street, W.C.

Best Bath Stone.

CORSHAM DOWN, FARLEIGH DOWN, } SUMMER DRIED.

BOX GROUND. COMBE DOWN. WESTWOOD GROUND.
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